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O.K.

January 26, 1988

California Regional Water
Quality Control Board
Los Angeles Region
107 S. Broadway, Suite 4027
Los Angeles, CA 90012-4596

Attention: Mr. Dainis Kleinbergs

Subject: Site Assessment Report - 2835 N. Naomi Street, Burbank, CA

Dear Mr. Kleinbergs:

In accordance with the June 17, 1987 California Regional Water Quality Control Board Guidelines for Site Assessment Plans, Ocean Technology, Inc. is submitting the enclosed Hydrogeologic Site Investigation Report. The report was prepared by our environmental engineering consultant firm, Brown and Caldwell, and includes a summary of the site's history, geology, hydrogeology, and laboratory analyses of soil samples taken during their investigation.

The report also describes Brown and Caldwell's conclusion and recommendation for remedial action at the tank site. Upon a thorough review of the subject report with our consultant, we believe there is sufficient evidence that indicates vertical migration of the compounds have not reached groundwater. Consequently, we propose to proceed with the following remedial action:

a. Excavate the "hot spot" soils immediately beneath the excavation site (estimated at 80 cubic yards (yd^3) maximum). Backfill the excavated area with high clay content fill and cover with a concrete slab to cap the site. This will create an impermeable barrier to minimize future infiltration and leaking of the chemical constituents from the soils.

b. Install a vadose zone monitoring well in the center of the former excavation to monitor vapor levels.

Presently, the excavation has been covered over with asphalt to minimize the possibility of surface water migration.

We appreciate your cooperation and understanding on this project. Upon receipt of approval for the remedial action proposed, we will immediately proceed with its implementation. Should you have any questions or comments on this report, we would be pleased to meet with you at your convenience.

Very truly yours,

OCEAN TECHNOLOGY, INC.

E. Palic
Plant Engineer

EP:sv

Enclosure

cc: J. S. Medeiros

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OCEAN TECHNOLOGY, INC.

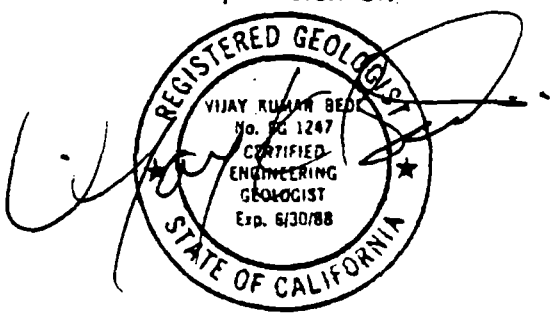
Burbank, California

HYDROGEOLOGIC SITE INVESTIGATION REPORT

— □ —

January 1988

Prepared Under the Supervision of:



Vijay Bedi
Chief Engineer

SITE ASSESSMENT REPORT

Brown and Caldwell
Consulting Engineers

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HYDROGEOLOGIC SITE INVESTIGATION REPORT

OCEAN TECHNOLOGY, INC., BURBANK, CALIFORNIA

In accordance with the request of Ocean Technology Inc.(OTI), Brown and Caldwell (BC) has performed a site investigation at the OTI facility located at 2835 North Naomi Street, Burbank, California (Figure 1). The contents of this report include site background, site investigation objectives, geology and hydrogeology, field investigation, laboratory analyses and results, and related conclusions and recommendations.

Site Background

The project location is presented in Figure 2. A former 550-gallon underground storage tank was located near a storm drain between the Maintenance Building and Building Number 1, south of the parking area. Previous investigations were performed at the site by Gregg and Associates, Inc. (GA), Harding Lawson Associates (HLA), and CH2M Hill. According to the November 24, 1986 HLA report, between 1965 and 1977, the tank was used to store machine cutting oils. According to an OTI departmental correspondence, included in the HLA report, the underground tank was used to store spent 1,1,1, trichloroethane (TCA) and isopropyl alcohol (IPA) between the years of 1977 and 1985. In March of 1985, the tank was reportedly emptied of the spent solvents and sealed by the Oil Process Company.

During an attempted tank excavation project in September 1985, the tank was punctured during excavation. Reportedly, there was no liquid in the tank at the time, and no liquid discharge occurred from the tank subsequent to the puncture. The Regional Water Quality Control Board (RWQCB) representative at the site ordered the tank to be left in the ground and covered over with soil. In addition, an investigation for possible past leakage from the underground tank was ordered by the RWQCB. Since that time, OTI has contracted with three consulting firms to conduct site investigations. Figure 3 presents the locations of borings advanced by the previous three consultants, as well as the borings advanced by Brown and Caldwell for this site investigation.

In October 1985, GA drilled two borings (OTI B-1, OTI B-2) to a depth of 40 feet. Soil samples were analyzed for TCA using USEPA Test Method 8010. TCA levels in the B-2 boring were found to exceed the detection limit.

In February 1986, CH2M Hill advanced one boring (B-3) to a depth of 82 feet. The 30-foot interval soil sample was analyzed using USEPA Test Method 8010. The results of analyses indicated concentrations of acetone, oil and grease and isopropyl alcohol above

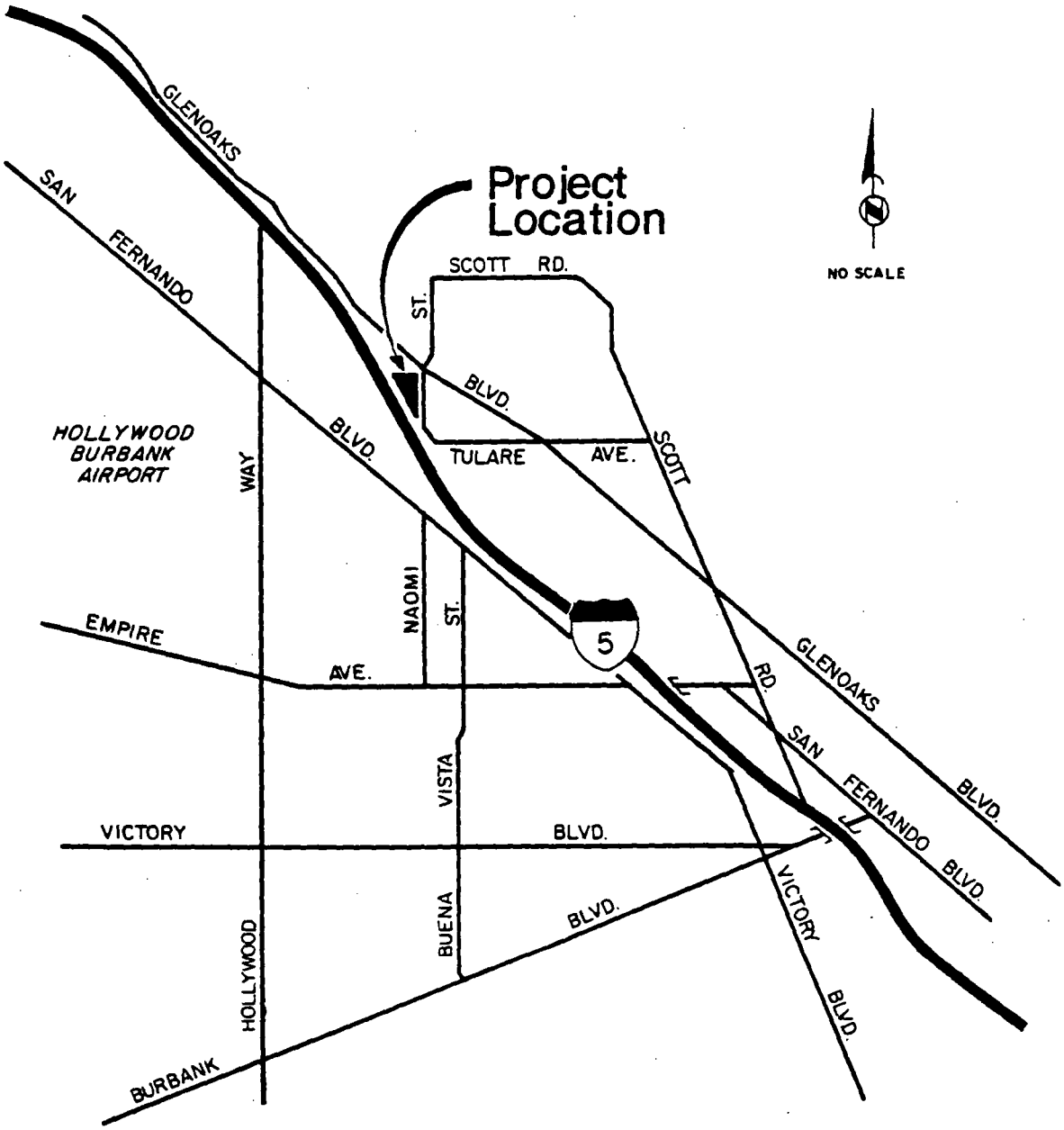

Figure 1 Vicinity Map

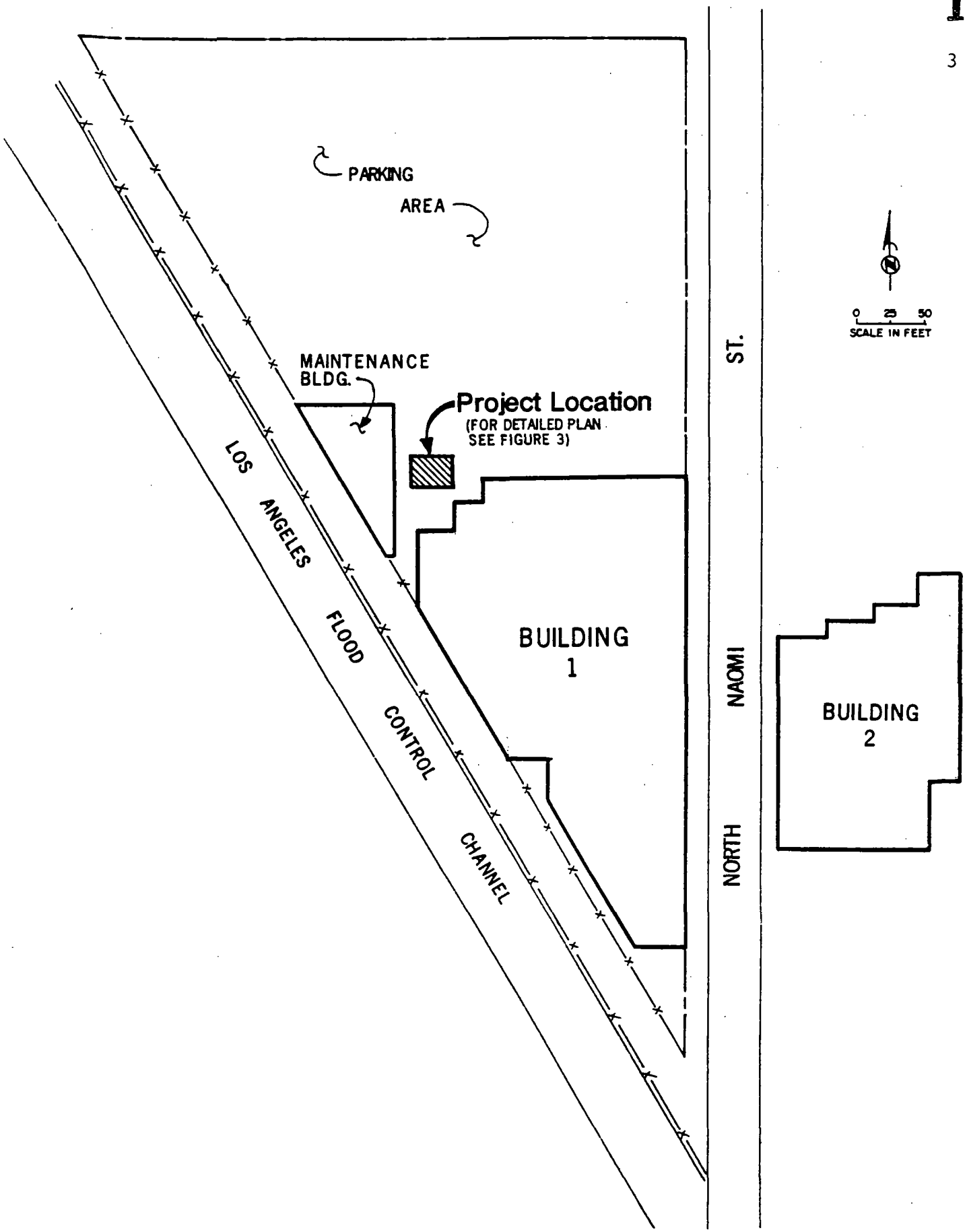

Figure 2 Facility Plan and Project Location

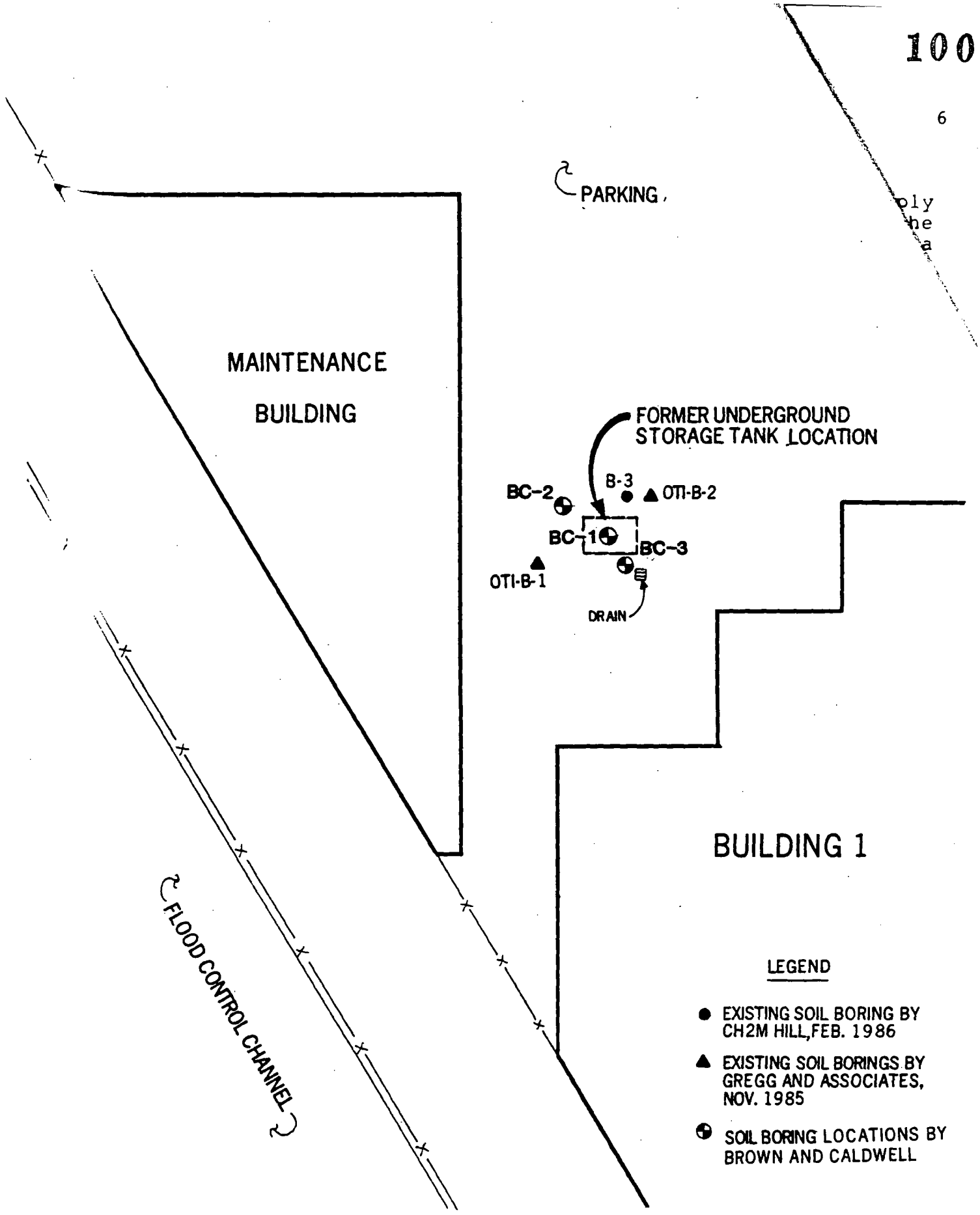

Figure 3 Former Underground Storage Tank Location and Soil Boring Locations

detection limits. The soil samples taker
intervals were analyzed using USEPA Method 8
not indicate detectable levels of TCA, IPA or

comply
by the
uct a

In May 1986, HLA was hired to develo
further site investigation. In September 1
by Crosby and Overton, and HLA took two sc
below the tank excavation hole. Both soil sam
using USEPA Test Method 8240. The results indica
undifferentiated C-3 chlorinated (non-priority pollutants) co
concentrations above detection limits in both samples. The results of the previous soil analyses are provided in Appendix A. Table 1 presents a general summary of the previous soil sampling locations and results.

Table 1. Summary of Consultant Soil Analysis at OTI Burbank

Consultant	Approx. date	Boring No.	Depths soil samples, feet	Analytical results, mg/kg	Chemical Constituents	Analysis Method
Gregg & Assoc.	10/85	OTI B-1	5, 10, 15, 20, 30, 40 (composite)	.007	TCA	8010 for TCA
		OTI B-2	5	6.200	TCA	
			10	12.000	TCA	
			15	.130	TCA	
			20	.150	TCA	
			30	520.000	TCA	
			40	.150	TCA	
CH2M Hill IPA	2/86	B-3	30	140	acetone	8010 - TCA,
				140	IPA	acetone, oil
				170	oil and grease	and grease
			50	ND		oil, grease
			70	ND		and 8240
			82 (btm of hole) not sampled			
HLA	5/86 & 12/86 reports	S-1	below tank	5	TCA	8240
				8	C-3	
		S-2	below tank	6	TCA	
				10	C-3	

ND = None Detected
mg/kg = Milligrams per kilogram

In the latest regulatory actions, OTI was requested to comply with the State of California AB 1803 site inspection program by the RWQCB. On September 8, 1987, BC submitted a work plan to conduct a site investigation at the OTI Burbank site.

Site Investigation Objectives

The site investigation objectives were to:

1. Determine the lateral and vertical extent of soil contamination.

2. Determine the existence and lateral extent of groundwater contamination, if groundwater was encountered.

3. Define the site specific and regional geology and hydrogeology, and determine soil properties which could affect contaminant mobility in the vadose zone.

4. Provide information on surrounding wells within 1/2-mile of the site.

5. Determine if further investigation or remedial action is necessary.

Regional Geology and Hydrogeology

The OTI Burbank facility is located on the water bearing unit called the San Fernando Valley Basin which is part of the South Coast Basin. The San Fernando Valley Basin is bounded on the east by the Verdugo Mountains and San Rafael Hills, on the north by the San Gabriel Mountains, on the west by the Santa Susana Mountains and Simi Hills, and on the south by the Santa Monica Mountains. A map of the San Fernando Valley Basin is presented in Figure 4. (Upper Los Angeles River Area, Watermaster Service, May 1986.)

The San Fernando Valley Basin Quaternary age sedimentary deposits, principally alluvial by origin, are derived of granitic basement complex eroded from the surrounding mountains and hills. The deposits are characterized by coarse crystalline sediments and comprised of, in descending order, Recent Alluvium, Older Alluvium and the Saugus Formation. The primary water bearing zones include the Older Alluvium and the Saugus Formation. Figure 5 presents a cross section with the site location projected on it.

The Recent Alluvium (Qal) is composed of coarse sediments in thick accumulations of boulders, gravel and sand and has been found up to 100 feet in thickness. The late Pliestocene age Older Alluvium (Qtc), which is apparently difficult to distinguish from the below lying Saugus Formation, is derived from stream deposits and is

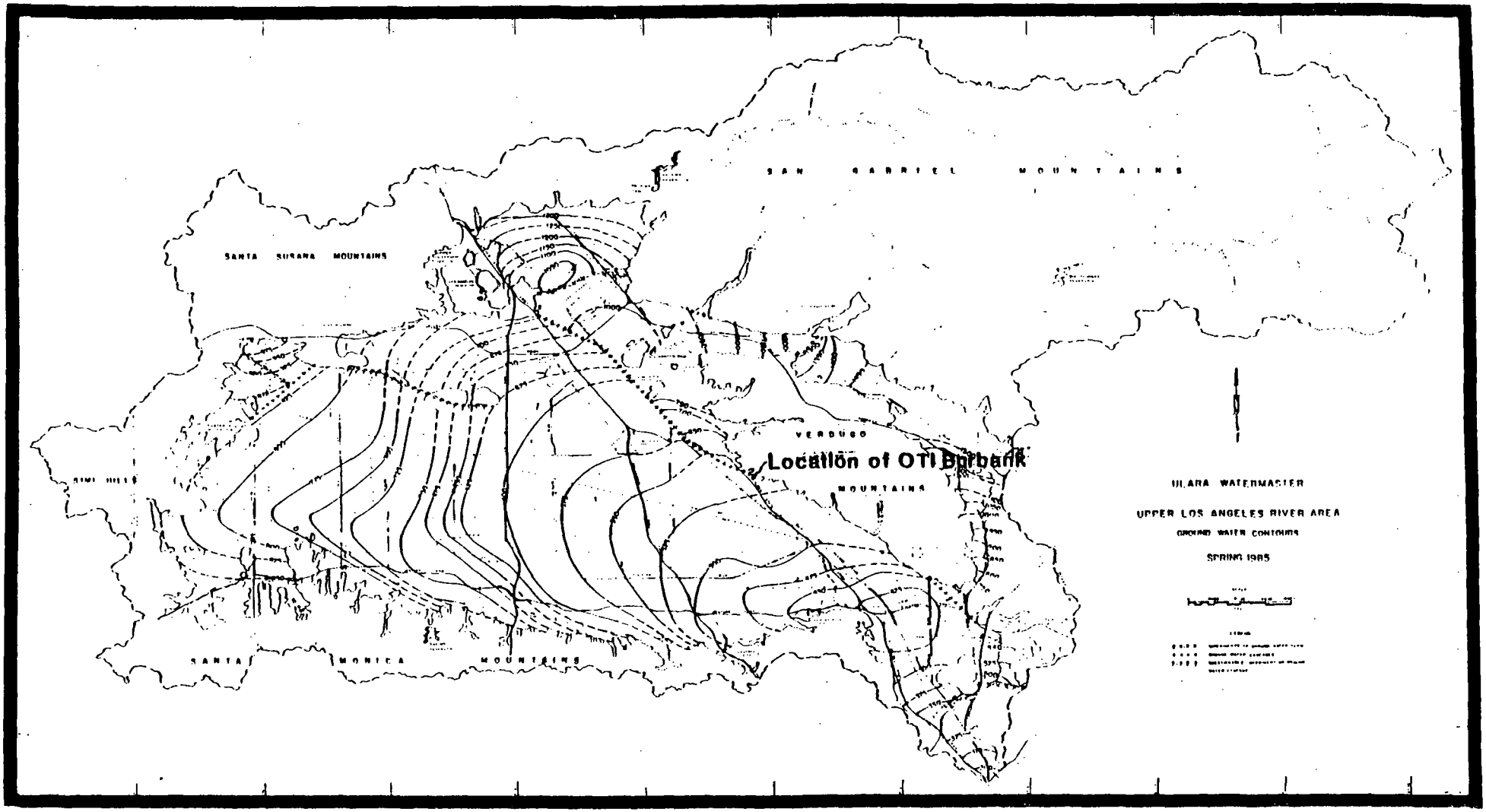

Figure 4 San Fernando Valley Basin Map

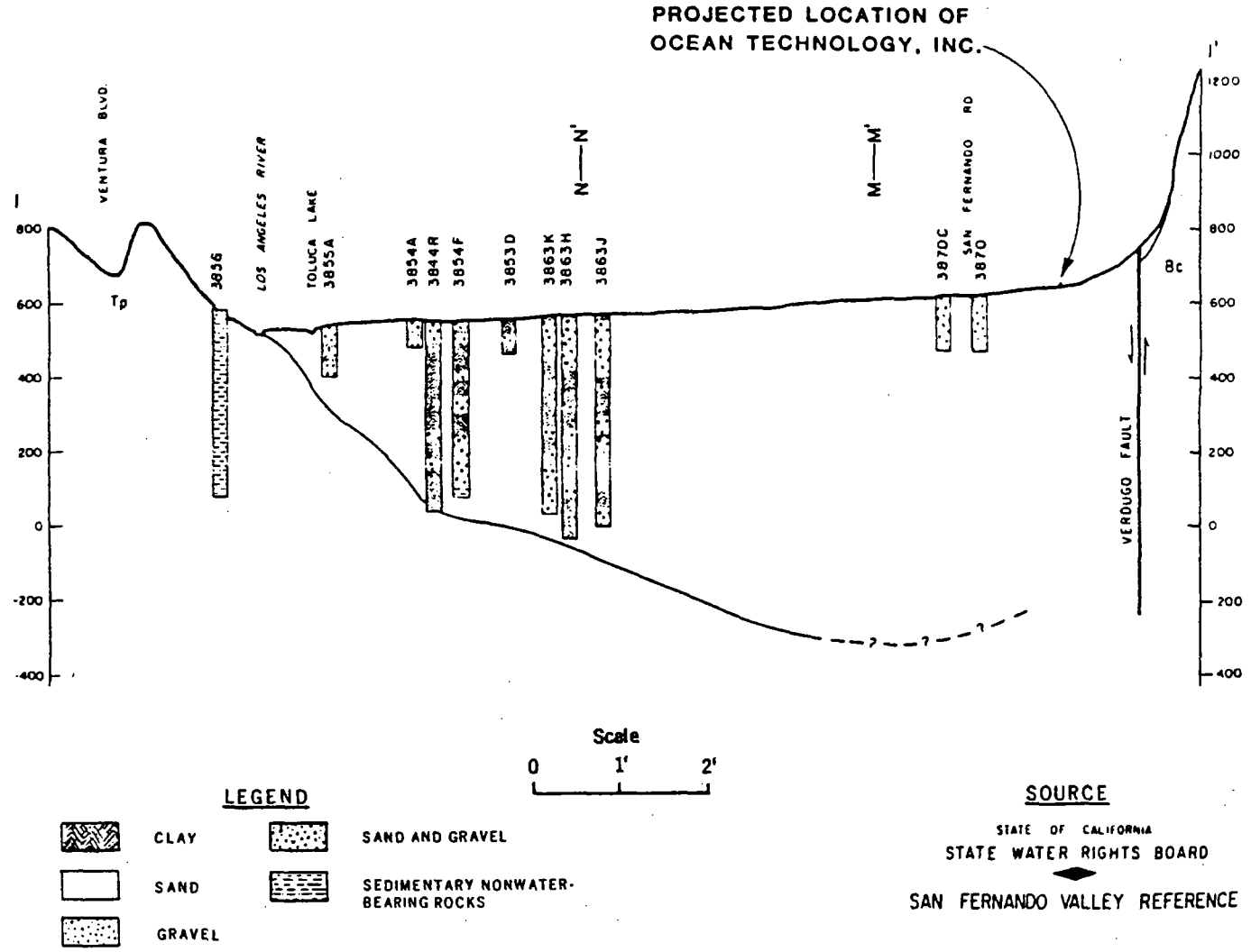

FIGURE 5 GEOLOGIC CROSS SECTION

composed of brown to grayish, well graded, angular to subangular gravels. Weathering episodes have produced layers and lenses of clay. The Older Alluvium has been found up to 2,000 feet in thickness. (Division of Mines and Geology, Bulletin 194-196; 1970-1975).

The San Fernando Valley Basin groundwater is primarily recharged by rain water runoff from surrounding mountains and hills, and surface water bodies such as the Los Angeles River and Aqueduct. According to the Watermaster Service the eastern portion of the basin, where the facility is located, contains approximately 2/3 of the groundwater storage capacity. Consequently the majority of groundwater extraction wells are located in the eastern side of the basin. The City of Burbank is the primary owner of extraction wells in the vicinity of the site.

Extraction Wells Surrounding OTI

Figure 6 presents the locations of three City of Burbank extraction wells in the vicinity of the site. Information about these wells was obtained through records on file with the Los Angeles County Department of Public Water Works. Appendix B includes the well reports and logs, and a groundwater quality report which was only available for Well No. 3882T. The ground water depth measured on April 27, 1987 for Well No. 4969B (closest well to the site) was 170 feet from the surface. Water level test wells located within a one-half mile radius of the site have either been destroyed, or there are no groundwater level records dated after 1960.

The following summarizes the subsurface geology documented in the geologic logs for the three extraction wells. For Well No. 4969B, the geology generally consisted of clayey sand and gravel beds. The less permeable sandy clay beds were encountered between 60-70 and 152-160 feet below the surface. The casing is perforated between 230-240 feet and since the groundwater level is 170 feet this implies a possible confined aquifer.

In Well No. 3882T, the geology consisted of predominately yellow clay with interbedded sand and gravel deposits. A 15-foot thick yellow clay layer appeared between 36 and 51 feet below the surface.

In Well No. 3850 J, the subsurface geology consisted of predominantly sand and gravel mixtures down to 278 feet followed by a generally uninterrupted 200-foot bed of yellow clay between 385 and 525 feet below the surface.

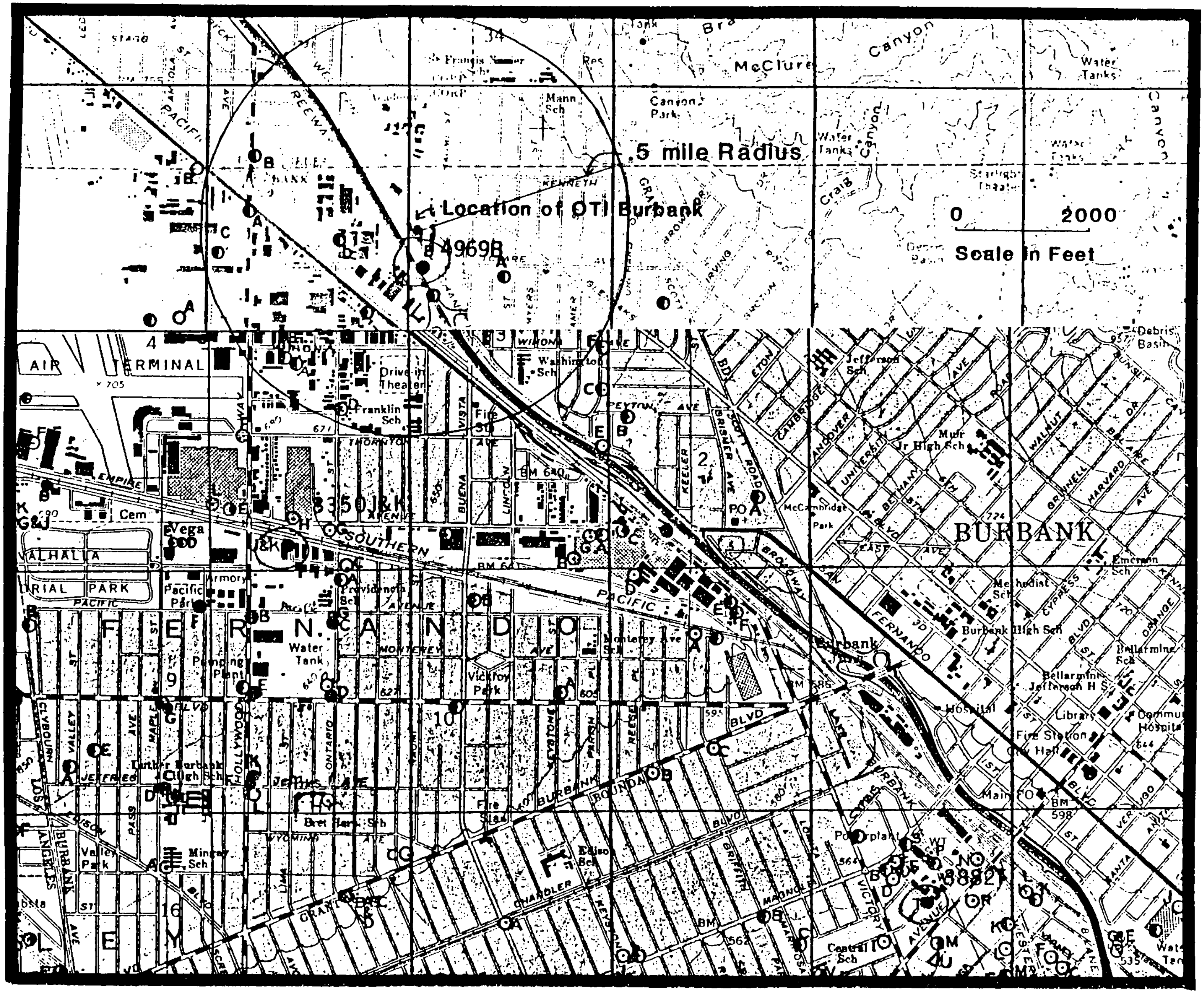

Figure 6 Map of Extraction Wells

Field Investigation

On October 26 and 27, 1987, BC drilled three Soil Borings (BC-1, BC-2 and BC-3). Boring BC-1 was placed directly in the center of the excavation where the tank was located. This was on the assumption that leakage would primarily migrate vertically, as according to past boring logs, the soils in the vicinity of the tank are relatively permeable. BC-2 was placed to evaluate the extent of contamination northwest of the tank, and BC-3 was placed to evaluate the soil southeast of the tank. The work plan specified that BC was to drill to a depth of 60 feet or 10 feet below detectable contamination in order to adequately evaluate the vertical extent of the contamination. Due to the presence of large and dense gravelly material in the boring path, the drill bit was unable to advance below the detectable contamination level (based on vapor analysis performed with an Organic Vapor Analyzer (OVA). In BC-1 and BC-3, a depth of 75 feet below the surface was reached, and in BC-2 a depth of 85 feet below surface was reached.

The soil borings were drilled with a Mobile B-61 drill rig equipped with 8-inch and 10-inch diameter continuous flight hollow-stem augers. Prior to drilling each boring, the hollow-stem augers and all down-hole equipment were steam-cleaned to prevent cross contamination between borings. All soil cuttings generated by the drilling operations were collected in drums that were labeled with the boring number and depth and then stored on-site.

Soil samples were collected at 5-foot intervals using a modified California sampler. The sampler was driven 18 inches below the bottom of the auger bit using a 140-pound hammer dropped 30 inches. The sampler contained three 2-inch diameter, 6-inch long brass tubes for collection of soil samples. Prior to collection of each soil sample, the sampler and brass tubes were cleaned with alkonox detergent and rinsed in clean water to prevent cross contamination between samples.

The lower most sample in the sampler was covered on each end with teflon sheets, capped with plastic end caps and sealed with electrical tape, then placed on ice in an ice chest to minimize loss of volatiles. The ice melt water was frequently drained and the ice chest water plug was left open for continuous drainage.

The middle brass tube of each sample interval was monitored for organic vapors by first discarding the upper 1-inch of the sample and subsequently capping both ends with plastic caps. One cap had a slit at the top to allow a reading to be taken in the air space between the cap and the soil. The reading was taken with a small diameter probe of a Century OVA, Model OVA 128. The maximum organic vapor concentration detected was then recorded on the boring logs.

The middle and upper most soil sample was described by the field hydrogeologist using the Unified Soils Classification System (USCS) on standard boring logs. The boring logs are presented in Appendix C of this report.

Sample identification and chain-of-custody procedures were utilized for all samples collected during the field investigation to ensure sample integrity and to document sample possession from the time of collection to its ultimate disposal. Each sample container submitted for analysis had a label affixed to identify the sample by including date, time of collection, and sample number unique to the sample. In addition a description of the sample, any field measurements made, the sampling methodology, names of on-site personnel, and any other pertinent field observations were recorded on the boring log or in field records prepared for each boring drilled at the site. All samples were kept refrigerated and transported directly to Brown and Caldwell's Pasadena laboratory at the end of the work day. The chain-of-custody forms and Quality Control/Quality Assurance (QA/QC) forms for each sample are presented in Appendix D. Groundwater was not encountered in any of the borings and, therefore, groundwater samples were not collected.

Site Geology and Hydrogeology

The boring logs are presented in Appendix C. The subsurface soils encountered during drilling consisted of fine to coarse grained and coarse grained sands and gravels. There were traces of clay and silt mixed with the sand and gravel. Generally the soils were dense and would be relatively permeable to groundwater transmittal.

According to an upper Los Angeles area Watermaster map, the groundwater elevation in the vicinity of the site is approximately 525 feet above mean sea level and the flow direction is generally southernly. Figure 4 includes the Watermaster ground water contour map. The ground elevation at the facility was approximated at 690 feet using a USGS topographical map. The estimated depth to ground water at the site is therefore approximately 165 feet from the ground surface.

Laboratory Analysis

It was agreed by the RWQCB and OTI representatives that all soil samples collected at 5-foot intervals would be analyzed. The soil samples were analyzed using USEPA Test Method 8240 for purgeable organics and expanded to include acetone. The detection limit was agreed upon as close to 5 to 10 parts per billion (ppb) as could be obtained analytically. In addition, USEPA Test Method 418.1 for total petroleum hydrocarbons was used for soil samples from Boring No. BC-1.

Table 2. Contaminants Found in BC-1 Soil Samples
(ug/kg)

Sample depth (ft)	Fuel hydro-carbon	1,1,1 TCA	Acetone	1,2 Dichloro-ethane	Tetra-chloro-ethylene	Methylene chloride	Toluene	C4 Chlora-nated hydro-carbon	Dichloro-propanoyl chloride	Dioxane	Freon 113	Total 9 other organics	Total organics (not 1,1 TCA or hydrocarbons)	Total organics w/o Freon*
5	1,000	120	100	<5	5	<5	150	---	400	---	---	70	725	725
10	870	210	50	<5	70	<5	210	300	1,000	---	---	<	1,630	1,630
15	1,100	100	80	<5	30	<5	87	700	3,000	---	---	<	3,897	3,897
20	<5	<5	<50	<5	<5	13	<5	---	---	200	800	<	1,013	213
25	113	200	<250	<25	200	<25	540	300	3,000	---	---	<	4,040	4,040
30	2,100	59	<500	<50	550	<50	79	3,000	20,000	500	---	<	24,129	24,129
35	59	160	300	<5	19	11	9	---	200	1,000	---	62	1,601	1,539
40	13	30	80	<5	<5	5	31	---	---	500	---	0	616	616
45	20	11	<50	<5	<5	<5	8	---	---	300	---	500	808	808
50	22	8	700	<5	<5	<5	5	---	---	600	40	70	1,415	1,375
55	<5	5	<50	<5	<5	<5	12	---	---	200	---	5	217	212
60	<5	8	<50	6	<5	<5	18	---	---	100	---	86	210	210
65	<5	27	<50	15	<5	6	<5	---	---	50	---	58	129	129
70	<5	22	<50	7	<5	<5	30	---	---	---	---	6	43	43

< - less then laboratory detection limit
--- - not found
ug/kg - micrograms per kilogram
* - see laboratory letter in Appendix D

Table 3. Contaminants Found in BC-2 Soil Samples
(ug/kg)

Sample depth (ft)	1,1,1 TCA	Acetone	1,1 Dichloro-ethylene (1,1-DCE)	1,2 Dichloro-ethylene (1,2-DCE)	Methylene chloride	Toluene	Dioxane	Freon 113	Total 6 other organics	Total organics (not 1,1,1 TCA)	Total organics w/o Freon*
5	8	<50	<5	<5	<5	86	---	70	<	156	86
10	<5	<50	<5	<5	<5	18	---	100	<	118	18
15	<5	<50	<5	<5	<5	44	---	---	<	44	44
20	<5	<50	<5	<5	<5	9	60	70	<	139	69
25	<5	<50	<5	<5	<5	22	100	100	<	222	122
30	13	<50	<5	<5	<5	65	400	---	<	465	465
35	15	<50	<5	<5	8	<5	700	---	12	730	730
40	<5	70	<5	<5	25	6	300	100	<	501	401
45	<33	<50	<5	<5	12	<5	100	---	10	122	122
50	9	<50	<5	<5	9	18	100	---	5	132	132
55	52	<50	<5	<5	<5	46	---	---	6	52	52
60	23	<50	<5	<5	8	14	200	---	13	235	235
65	21	<50	<5	9	<5	<5	---	---	<	9	9
70	130	<50	15	35	<5	<5	---	---	17	67	67
75	83	70	37	<5	<5	6	---	---	89	202	202
85	<5	<50	<5	<5	13	<5	---	100	<	113	13

< - less than laboratory detection limit
--- - not found
ug/kg - micrograms per kiligram
* - see laboratory letter in Appendix D

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Table 4. Contaminants Found in BC-3 Soil Samples
(ug/kg)

Sample depth (ft)	1,1,1 TCA	Acetone	Methylene chloride	Tetra-chloro-ethylene	Toluene	Dichloro-propanyl chloride	Dioxane	Freon 113	Methyl butynol	Total organics (not 1,1,1 TCA)	Total organics w/o Freon*
5	95	---	12	14	71	300	---	---	---	397	397
10	21	100	10	5	96	400	70	90	---	771	681
15	<5	100	12	<5	<5	---	80	100	---	292	192
20	<5	100	12	<5	<5	---	600	200	---	912	712
25	6	100	12	<5	<5	---	700	500	---	1,312	812
30	21	200	17	<5	<5	---	600	100	---	917	817
35	53	300	20	<5	<5	---	800	90	200	1,410	1,320
40	<5	200	13	<5	<5	---	300	100	100	713	613
45	<5	100	8	<5	<5	---	100	---	60	268	268
50	11	100	12	<5	<5	---	400	60	60	632	572
55	7	200	10	<5	<5	---	900	200	---	1,310	1,110
60	11	600	10	<5	<5	---	60	200	200	1,070	870
65	12	900	11	<5	<5	---	---	200	---	1,111	911
70	13	60	11	<5	<5	---	---	70	---	141	71
75	<5	100	8	<5	<5	---				108	108

--- - not found
< - less than laboratory detection limit
ug/kg - micrograms per kilogram
* - see laboratory letter in Appendix D

Table 5. Previous Contaminants found in Soil Samples

Gregg & Associates

OTI B-1 (ug/kg), ppb

Sample depth (ft)	1,1,1 TCA
5, 10, 15, 20, 30, 40 composite	.7
OTI B-2	
5	6,200
10	12,000
15	130
20	130
30	520,000
40	150

Table 6. Previous Contaminants found in Soil Samples

CH2M Hill

B-3 (Mg/kg) ppm

Sample depth (ft)	Oil & grease	Isopropyl alcohol	Acetone	Other total organics
30	170	140	140	<3
50	<10	<.3	<.3	<.3
70	<10	<.3	<.3	<.3

Table 7. Previous Contaminants found in Soil Samples

Harding Lawson Associates

(Mg/kg) ppm

Sample depth (ft)	1,1,1 TCA	C3 chloronated compound	Isopropyl alcohol	Other total organics
S-1				
Below tank	5	8	<.3	<.3
S-2				
Below tank	6	10	<6	<.3

mg/kg - millograms per kilograms, parts per million
ug/kg - micrograms per kilogram, parts per billion
< - less than laboratory detection limit

Table 8. Chemical Uses

Chemical Constituent	Common Usage
Benzene	Solvent for fats, paints, plastics, inks, oils, etc. Ingredient in motor fuels.
1,1 Dichloroethane 1,1-DCA	Used as a solvent and cleaning/degreasing agent.
1,2 Dichloroethane 1,2-DCA DCE	(Ethylene Dichloride). Soluent for resins, asphalt, bitumen, rubber, cellulose acetate, cellulose ester and paint. Found in varnishes and is an anti-knocking additive.
Dichloropropanals	Solvent for hard resins and nitrocellulose. Used in manufacturing of photographic chemicals and laquer. Used as a cement for celluloid and a binder for water colors.
Dioxane	Solvent for cellulose acetate, dyes, fats, greases, lacquers, mineral oil, paints polyvinyl polymers, resins, varnishes and waxes. Also a melting and dispersing agent commonly found as a contaminant of 1,1,1 TCA.
Freon	Used as aerosol propellant and refrigerant.
Methylene Chloride	Principally used as a low temperature extractant of substance which are adversely affected by high temperatures. Can be used as a solvent for fats, waxes, bitumen, cellulose acetate and esters. Also used as a paint remover and degreaser.
Methyl Ethel Ketone	Solvent in nitro-cellulose coating and vinyl film manufacturing. Used in cements and adhesives and in the dewaxing of lubricating oils.
Tetrachloroethylene	Solvent mainly used as a dry cleaning agent, degreaser and chemical intermediate.
Toluene	Solvent for paints and coatings and as component in auto and aviation fuels.
1,1,2 Trichloroethane	Chemical intermediate and solvent less common than 1,1,1 TCA.
1,1,2,2 Trichloroethane	Used in dry cleaning agent, fumigant, cement and lacquer. Once was used as solvent.
Trichloroflouromethane	Refrigerant aerosal propellant and foaming agent.

Tables 2 through 4 present a summary of the contaminants found in the BC soil samples. Tables 5 through 7 present a summary of the contaminants found in previous soil samples. A complete listing of all the analytical results collected during boring drilling by BC are presented in Appendix D. A listing of previous analytical results (performed by other consultants) are presented in Appendix A. Table 8 presents the common usages for some of the chemical contaminants found in the soil samples.

Results

Soil samples for all three BC borings indicate a wide variety of organics that are commonly used as solvents. Isopropyl alcohol was not found in the soil samples or found as impurities in the solvents. Overall Boring BC-1, which is located directly through soils below the former tank indicated highest TCA and Organic concentrations. Boring BC-1 soil samples (Table 2) indicate concentrations for Dichloropropanyl chloride, (200-20,000 ppb) C4 Chlorinated hydrocarbons (300-3,000) and Dioxane (50-1,000 ppb) in samples from 20 to 65 feet. 1,1,1 TCA and toluene were also found at detectable levels throughout BC-1. The highest 1,1,1 TCA concentration reached 210 ppb at 10 feet, and decreased to 22 ppb at the bottom of the boring (70 feet). At the bottom of the boring, total organics had decreased by almost two orders of magnitude from the maximum concentration of greater than 24,000 ppb present at 30 feet.

In BC-2 samples (Table 3), the concentrations of Dioxane are again high (60-700 ppb) in samples between 20 and 60 feet. 1,1,1 TCA concentrations are highest at 55 to 70 feet, but is less than detectable in the 85-foot sample (bottom of the boring). Generally, total organic concentrations are highest between 15 feet and 40 feet and were found at less than 200 ppb in the 85-foot sample. (13 ug/kg at 85 feet, if freon is discounted - see note below).

In BC-3 soil samples (Table 4) Dioxane is in the 60-900 ppb range at 20 to 60 feet, and becomes less than detectable below 60 feet. Acetone concentrations are above 100 ppb throughout the boring. Methylene chloride concentrations do not exceed 20 ppb but are present throughout. 1,1,1 TCA concentrations do not exceed 100 ppb and are found at low concentrations intermittent with non-detectable zones. Total organics are highest at depths of less than 70 feet. The 70- and 75-foot samples (last two taken in the boring) are over an order magnitude less than the highest concentrations found at the shallower depths in the boring.

NOTE:

The laboratory has indicated that the freon present in the samples may be a result of contamination from laboratory sample preparation. A letter from the laboratory explaining this has been

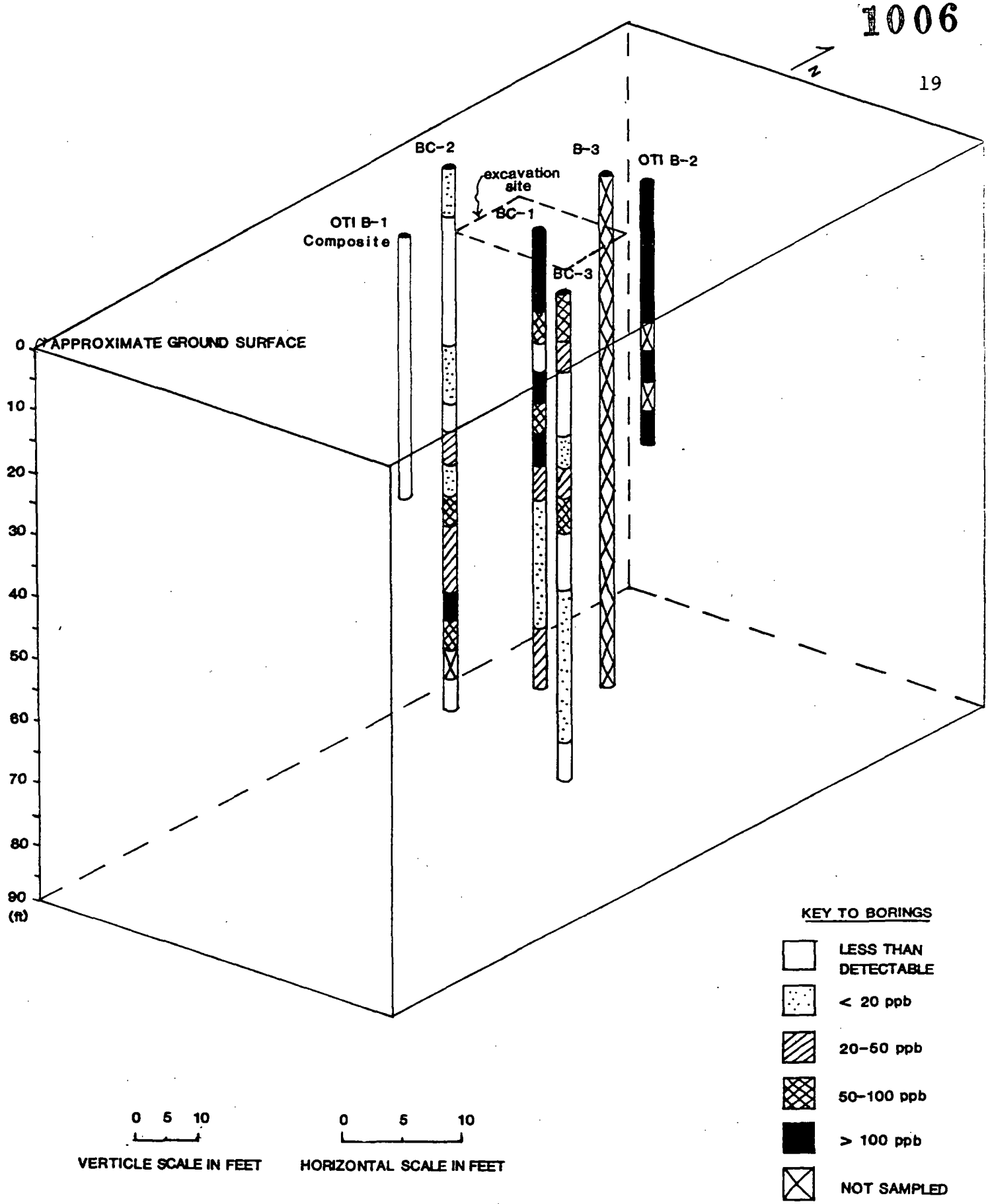


Figure 7 1,1,1 TCA Concentrations

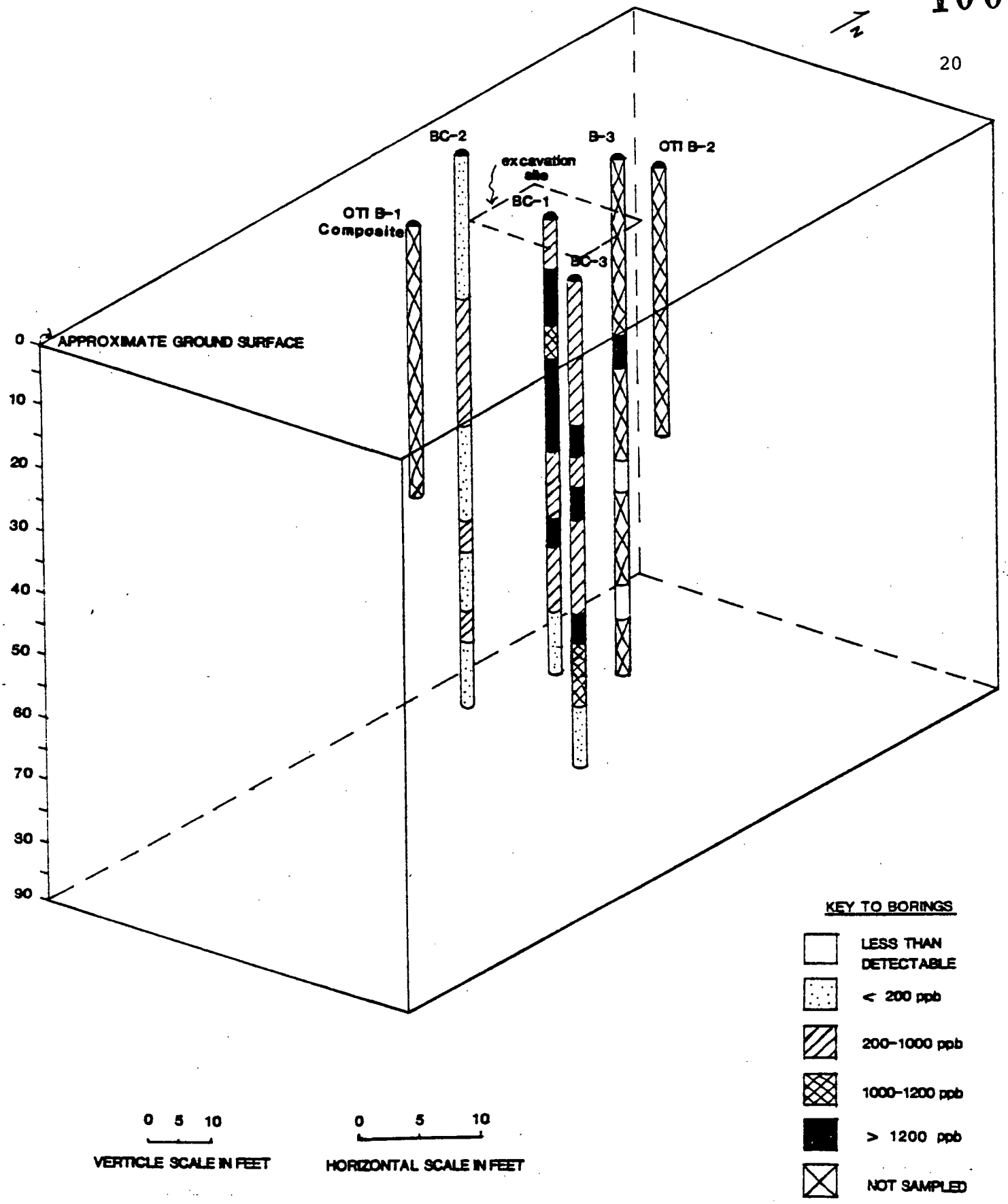


Figure 8 Total Organics Concentrations
(excluding 1,1,1 TCA and FUEL HYDROCARBONS)

included in Appendix D. To take this into account, Tables 2 through 4 have a column detailing total organics without freon being included.

Conclusions

1. Groundwater was not encountered at or above a depth of 85 feet during the field drilling. Based on nearby extraction well No. 4969B, the groundwater is approximately 170 feet below the surface.

2. Several organic constituents were found in all soil samples in the vicinity of the former tank. Most of these organics are commonly used in solvents. Hydrocarbons were found in some BC-1 soil samples. BC-2 and BC-3 soil samples were not analyzed for hydrocarbons.

3. Highest organic concentrations and 1,1,1 TCA were detected in boring BC-1 located through the tank excavation site down to 70 feet. Total organic concentrations were found at less than 200 ppb by the 75-foot level in all borings. 1,1,1 TCA concentrations remained in the 21 to 130 ppb range until 85 feet in BC-2.

4. The bulk 1,1,1 TCA concentrations appear to have principally spread in the upper 30 feet of the soils in BC borings. B-3 soil samples indicate total organics may not have reached lower depths in the southeast direction of the tank excavation.

5. As evidenced in the graphic representation of organic constituent distributions shown in Figures 7 and 8, the bulk of the chemical constituent plume appears to be in the 10 to 60 feet zone. Concentrations are decreasing at the bottom of the borings. It appears likely that the constituents may not have reached groundwater based on the decreasing concentrations found in the borings.

Recommendations

Based on the information developed during the site investigation and the information available from the previous reports, it is our recommendation that OTI consider the following options:

1. Excavation of "hot spot" soils immediately beneath the excavation site (estimated at 80 cubic yards (yd^3) maximum). Backfilling the excavated area with high clay content fill and covering with a concrete slab to cap the site and create an impermeable barrier to minimize future infiltrations and resulting leaching of the chemical

constituents from the soils. A single vadose zone monitoring well should be installed in the center of the former excavation to monitor vapor levels.

2. Installation of deep well vacuum air pumps surrounding the contaminated area. These pumps would pull a vacuum on the absorbed organic constituents causing their volatilization in the soil and removal to the surface for release or treatment. This option may involve obtaining treatment permits and a probable health risk analysis study. The time frame for remediation may be several years.

3. In place treatment through biodegradation, oxidation or surfacant use. These treatment processes require the use of large amounts of water and are thus susceptible to vertical migration of liquids. Due to the probable depth of groundwater beneath the site, the addition of liquids could drive the contaminants deeper into the subsurface soils through leaching. These processes do not usually work well with chlorinated hydrocarbon contamination such as is present at this site. Degradation products can be as toxic or more so than the original constituents. Finally, these processes are not economically feasible for treating the approximate 80 yd^3 of material that, in our opinion, is all that is necessary to treat. The time frame also could be a year or more for treatment.

We recommend option number one as the best alternative. In our opinion, it is the most effective in terms of all factors considered (including time, feasibility, apparent quantity of leakage, and depth to groundwater) and is just as effective as either of the other two alternatives in terms of remediation to protect the drinking waters and people of the State of California. Details of implementation of the recommended remedial action (Option 1) are presented in the following section.

Recommended Remedial Action Implementation

Prior to placement of any engineered fill in the tank excavation, the excavation should be cleaned of loose soil, and any cracked concrete/asphalt in the area should be removed. Any loose fill or contaminated soils below the concrete slab should also be removed and disposed of in an appropriate manner.

After removal of all loose and deleterious materials, the tank excavation and the area around it should be backfilled with clean, clayey engineered fill. The engineered fill should meet the following minimum requirements:

1. The clean fill material should be clayey in nature and should contain a minimum of 60 percent fraction passing the No. 200 sieve, and have a minimum plasticity index of 15.

2. All clean backfill should be placed in layers not exceeding 8 inches in uncompacted thickness, moisture-conditioned as necessary, and compacted to a minimum of 90 percent relative compaction as determined by ASTM Test Method D1557-78.

3. Compaction testing for quality assurance should be performed by a certified soil testing laboratory in accordance with Item 2 above. Quality assurance tests should also be performed for fill material in accordance with Item 1 above.

4. After placement of clean engineered fill in the excavation and area around the excavation, the area should be paved with portland cement concrete.

5. All finished grades should be sloped away from the area to minimize ponding of water in the area of previous excavation.

In our opinion, the above remedial action would minimize the potential of further migration of organics in the subsoils or groundwater. The proposed concrete cover will restrict infiltration and thus prevent migration of organics to the groundwater. Also, as the source of the organics has been removed, no discharge of additional organics can occur. Finally, natural degradation of the existing organics will occur with time. The vadose zone monitoring well will allow future monitoring of the site.

Appendix A
PREVIOUS ANALYTICAL RESULTS

ANALYTICAL TECHNOLOGIES, INC.

ATI I.D. 28301

1,1,1- TETRACHLOROETHANE
DATA SHEET

CLIENT : GREGG & ASSOCIATES
DATE RECEIVED : 10-9-85
DATE REPORTED : 10-17-85
PROJECT NO. : 85-154-001

SAMPLE MATRIX : SOIL
METHOD : EPA 8010
DATE ANALYZED : 10-16-85
UNITS : ug/Kg

ATI SAMPLE I.D.	CLIENT SAMPLE I.D.	TCA	SURROGATE RECOVERY %
5-10	B1 COMPOSITE	20.7	72.8
11	B2-5'	6200	92.7
12	B2-10'	12000	107
13	B2-15'	130	75.2
14	B2-20'	150	67.8
15	B2-30'	220000	*
16	B2-40'	150	56.1

* DIRECT INJECTION- NO SURROGATE ADDED.

Results of laboratory analyses performed on the soil samples collected from the two borings are tabulated below. The laboratory report from Analytical Technologies, Inc. is included in Appendix B. In the laboratory report, a typographic error was made. The report states that the soil samples were analyzed for 1,1,1 - Tetrachloroethane (TCA). Upon receiving those results Gregg & associates, Inc. questioned ATI and found that a typographic error had been made and in fact the soil samples were analyzed for 1,1,1 Trichloroethane as requested. At the time this report was compiled, the corrected laboratory results report was not available, but will be forwarded when possible.

TABLE 1

BORING	DEPTH (FEET)	CONCENTRATION OF 1,1,1-TRICHLOROETHANE (~~PPM~~) → ppb
OTI-B-1	5, 10, 15, 20, 30, 40 (composite)	0.7
OTI-B-2	5	6200
	10	12000
	15	130
	20	150
	30	520,000
	40	150

BROWN AND CALDWELL
ANALYTICAL LABORATORIES

LOG NO: P86-02-030

Received: 03 FEB 86
Reported: 10 FEB 86

John [illegible]owski
CH2M [illegible]
1301 [illegible] Street, Suite 800
Newport Beach, California 92660

Project: N20391.B0

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
02-030-1	B-3-30	03 FEB 86

PARAMETER	02-030-1
Oil & Grease by Infrared, mg/kg	170
Isopropyl Alcohol, mg/kg	140

LOG NO: P86-02-030

Received: 03 FEB 86
Reported: 10 FEB 86

John Dolegowski
CH2M.HILL
1301 Dove Street, Suite 800
Newport Beach, California 92660

Project: N20391.B0

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
02-030-1	B-3-30	03 FEB 86

PARAMETER	02-030-1
EPA Method 8010	
Date Extracted	02/07/86
1,1,2,2-Tetrachloroethane, mg/kg	<0.3
1,1,2-Trichloroethane, mg/kg	<0.3
1,1-Dichloroethane, mg/kg	<0.3
1,1-Dichloroethene, mg/kg	<0.3
1,2-Dichloroethane, mg/kg	<0.3
trans-1,2-Dichloroethene, mg/kg	<0.3
1,2-Dichloropropane, mg/kg	<0.3
2-Chloroethylvinylether, mg/kg	<0.3
Bromodichloromethane, mg/kg	<0.3
Bromomethane, mg/kg	<0.3
Bromoform, mg/kg	<0.3
Chlorobenzene, mg/kg	<0.3
Carbon Tetrachloride, mg/kg	<0.3
Chloroethane, mg/kg	<0.3
Chloroform, mg/kg	<0.3
Chloromethane, mg/kg	<0.3
Dibromochloromethane, mg/kg	<0.3
Dichlorodifluoromethane, mg/kg	<0.3
Methylene chloride, mg/kg	<0.3
Tetrachloroethene, mg/kg	<0.3
1,1,1-Trichloroethane, mg/kg	<0.3

LOG NO: P86-02-030

Received: 03 FEB 86
Reported: 10 FEB 86

John Dolegowski
CH2M.HILL
1301 Dove Street, Suite 800
Newport Beach, California 92660

Project: N20391.B0

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
02-030-1	B-3-30	03 FEB 86

PARAMETER	02-030-1
Trichloroethylene, mg/kg	<0.3
Trichlorofluoromethane, mg/kg	<0.3
Vinyl chloride, mg/kg	<0.3
cis-1,3-Dichloropropene, mg/kg	<0.3
trans-1,3-Dichloropropene, mg/kg	<0.3
Other EPA Method 8010,	<0.3
Acetone, mg/kg	140

Edward Wilson, Laboratory Director

LOG NO: P86-02-037

Received: 03 FEB 86
Reported: 19 FEB 86

John Dolegowski
CH2M.HILL
1301 Dove Street, Suite 800
Newport Beach, California 92660

Project: N20391.B0

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
02-037-3	B-3-70	03 FEB 86

PARAMETER	02-037-3
Oil & Grease by Infrared, mg/kg	<10
Purgeable Priority Pollutants	
Extraction	02/14/86
Acrolein, mg/kg	<3
Acrylonitrile, mg/kg	<3
Other Purgeable Priority Pollutants,	<0.3

LOG NO: P86-02-037

Received: 03 FEB 86
Reported: 19 FEB 86

John Dolegowski
CH2M.HILL
1301 Dove Street, Suite 800
Newport Beach, California 92660

Project: N20391.B0

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
02-037-4	B-3-10	03 FEB 86
02-037-5	B-3-20	03 FEB 86
02-037-6	B-3-60	03 FEB 86
02-037-7	B-3-40	03 FEB 86

PARAMETER		02-037-4	02-037-5	02-037-6	02-037-7
Sample Held, Not Analyzed		HOLD	HOLD	HOLD	HOLD

LOG NO: P86-02-037

Received: 03 FEB 86
Reported: 19 FEB 86

John Dolegowski
CH2M.HILL
1301 Dove Street, Suite 800
Newport Beach, California 92660

Project: N20391.B0

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
02-037-2	B-3-80	

PARAMETER	02-037-2
Sample Held, Not Analyzed	HOLD

Edward Wilson, Laboratory Director

BROWN AND CALDWELL BC
ANALYTICAL LABORATORIES

LOG NO: P86-09-546

Received: 26 SEP 86
Reported: 14 OCT 86

Gary Halbert
Harding Lawson Associates
15621 Redhill Ave.,Suite 100
Tustin, California 92680

Project: 17876,001.11

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
09-546-1	S-1	26 SEP 86
09-546-2	S-2	26 SEP 86

PARAMETER	09-546-1	09-546-2
Purgeable Priority Pollutants		
Extraction	10/09/86	10/09/86
1,1,1-Trichloroethane, mg/kg	5	6
1,1,2,2-Tetrachloroethane, mg/kg	<0.3	<0.3
1,1,2-Trichloroethane, mg/kg	<0.3	<0.3
1,1-Dichloroethane, mg/kg	<0.3	<0.3
1,1-Dichloroethylene, mg/kg	<0.3	<0.3
1,2-Dichloroethane, mg/kg	<0.3	<0.3
1,2-Dichloropropane, mg/kg	<0.3	<0.3
1,3-Dichloropropene, mg/kg	<0.3	<0.3
2-Chloroethylvinylether, mg/kg	<0.3	<0.3
Acrolein, mg/kg	<3	<3
Acrylonitrile, mg/kg	<3	<3
Bromodichloromethane, mg/kg	<0.3	<0.3
Bromomethane, mg/kg	<0.3	<0.3
Benzene, mg/kg	<0.3	<0.3
Chlorobenzene, mg/kg	<0.3	<0.3
Carbon Tetrachloride, mg/kg	<0.3	<0.3
Chloroethane, mg/kg	<0.3	<0.3
Bromoform, mg/kg	<0.3	<0.3
Chloroform, mg/kg	<0.3	<0.3
Chloromethane, mg/kg	<0.3	<0.3
Dibromochloromethane, mg/kg	<0.3	<0.3
Ethylbenzene, mg/kg	<0.3	<0.3
Methylene Chloride, mg/kg	<0.3	<0.3
Tetrachloroethylene, mg/kg	<0.3	<0.3

LOG NO: P86-09-546

Received: 26 SEP 86
Reported: 14 OCT 86

Gary Halbert
Harding Lawson Associates
15621 Redhill Ave.,Suite 100
Tustin, California 92680

Project: 17876,001.11

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
09-546-1	S-1	26 SEP 86
09-546-2	S-2	26 SEP 86

PARAMETER	09-546-1	09-546-2
Trichloroethylene, mg/kg	<0.3	<0.3
Trichlorofluoromethane, mg/kg	<0.3	<0.3
Toluene, mg/kg	<0.3	<0.3
Vinyl Chloride, mg/kg	<0.3	<0.3
trans-1,2-Dichloroethylene, mg/kg	<0.3	<0.3
trans-1,3-Dichloropropene, mg/kg	<0.3	<0.3
Isopropyl Alcohol, mg/kg	<0.3	<6
Semi-Quantified Results **		
A C3 Chlorinated Compound, mg/kg	8	10

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

Edward Wilson, Laboratory Director

Appendix B

EXTRACTION WELLS SURROUNDING OTI

SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION
WELL DATA

Owner: City of Burbank

Location and Description: 35'SW of ℄ Lake St.; 40' SE of ℄ Orange Grove Ave.; [Note: Marked map of Burbank Public Service Dept. shows #15 northerly of Orange Grove & easterly of Lake.]

Use: Municipal Supply

Elev. of average grd. at well: 559± U.S.G.S. Datum

Elev. of grd. adjacent to well: 552.7±- 11-27-72 U.S.G.S. Datum

Water surface reference points:

(a) From 4-13-52 To _____ Elev. 560.0' How det. Burbank Levels
Description: Airgage @ base of pump

(b) From 11-27-72 To _____ Elev. 5511 How det. Owner
Description: Airgage, 8.4' above pumphouse & 5.4' above grd. surface

(c) From _____ To _____ Elev. _____ How det. _____
Description: _____

(d) From _____ To _____ Elev. _____ How det. _____
Description: _____

Type of well: _____ Size 20"

Original depth: 498' Soundings: _____

Pumping equipment: _____

Power used: _____

Capacity: 1750 GPM Drawdown 87'

Date drilled: May 15, 1950 By James W. Busby

Aquifer characteristics: _____

Quality of water: _____

Remarks: Airline length = 260' - 11-27-72

Well Numbers
Owner 15
D.W.R. _____
U.S.W.B. _____
F.C. 38827

LOG OF WELL NO. 3882 T

FROM	TO	CLASSIFICATION OF MATERIALS
0	9	Sand & gravel f" few boulders.
9	13	Clay black.
13	36	Sand & gravel 3/4" few boulder.
36	51	Clay yellow.
51	54	Sandy black clay.
54	61	Clay yellow.
61	93	Sand gravel boulders 1 ft.
93	106	Clay yellow.
106	141	Sand & gravel 3/4" streaks of yellow clay.
141	143	Clay yellow.
143	146	Sand & gravel 1/2"
146	151	Clay yellow.
151	172	Sand & gravel 1/2" some to 2 1/2"
172	184	Clay yellow streaks gravelly clay.
184	197	Clay blue.
197	201	Sand clay yellow.
201	234	Clay yellow sticky.
234	246	Gravelly yellow clay.
246	248	Mucky sand & gravel streaks of yellow clay.
248	271	Clay yellow streaks gravelly clay.
271	278	Sand & gravel 3/4" tight dirty streaks clay yellow.
278	288	Clay yellow streaks gravelly clay.
288	291	Sand & gravel 3/4"
291	296	Clay yellow.
296	302	Dirty sand & gravel 1"
302	343	Clay yellow sticky.
343	357	Clay with gravel imbedded.
357	363	Sand & gravel 1/2"
363	376	Clay yellow with gravel.
376	382	Sand & gravel dirty 3/4"
382	389	Very sandy clay yellow.
389	394	Sand & gravel, sharp dirty 3/4"
394	411	Sand & gravel, sharp dirty.
411	420	Sandy clay yellow with gravel.
		Log [illegible] 1195.
		See [illegible]
		Well Log
		[illegible] Log [illegible]

37 ft. cement plug in bottom.

Perforations B-B Spec. hyd. (Ld) 9 holes per 14"; 271-278; 288-291, 298-304; 359-365; 372-381, 391-413; 422-453. (2nd) 153-174; 9 holes per 12". Holes 1/2" x 3 1/2"

Pump was set at 61'

Water level before pump 44' 31' (2nd) after pump 44' 32 (2nd)

Remarks Log point - above 55 ft.

(over)

76W848-106 -Cdb 4-67

SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
Water Conservation Division
WELL DATA

Owner: LOS ANGELES COUNTY FLOOD CONTROL DISTRICT

Location and Description: City of Burbank; in District Right of Way; 73'± E. of ℄ Naomi St. produced So.; 1055'± So. of ℄ Tulare St.; 110' SE of E.C. gate; 7' NE of Channel wall of Burbank Western Drainage Channel.

Use: Groundwater Observation in 6" dia pipe vault.

Elev. of average gnd. at well: 681±' U. S. G. S. Datum

Elev. of gnd. adjacent to well: U. S. G. S. Datum

Water surface reference points:

(a) From 6-20-73 To ____ Elev. 680.5' How det. [illegible]

Description: top of 2" pipe 0.5' below gnd. surface and top of 4" [illegible]

(b) From ____ To ____ Elev. ____ How det. ____

Description:

(c) From ____ To ____ Elev. ____ How det. ____

Description:

(d) From ____ To ____ Elev. ____ How det. ____

Description:

Type of well: Rotary drilled Size 2"

Original depth: 270' Sounding: 264' — 7-2-73
234' — 8-27-74

Pumping equipment: NONE

Water used:

Discharge: ____ Drawdown:

Date drilled: 6-26-73 by LACFCD

Casing documentation:

Quality of water:

Remarks: ℄ Storm drain plans # 275-418-D3.14

(over)

Well Numbers

Owner

D.W.R. 1N/14W [illegible]

D.W.R. 03F6

F.C. 4969B

LOG OF WELL NO. 4969 B

FROM	TO	CLASSIFICATION OF MATERIALS	FROM	TO	CLASSIFICATION OF MATERIALS
0	20	medium to coarse sand and gravel			
20	60	light brown clayey sand and gravel			
60	72	medium brown coarse sandy clay			
72	100	coarse sand, gravel, rock fragments			
100	120	light grey silty sand			
120	132	coarse sand, gravel, rock fragments			
132	160	medium brown sandy clay			
160	180	coarse sand			
180	240	coarse clayey sand			
240	270	light to medium brown, coarse sandy clay			

Perforations 230' - 240'

30' tail stock below perforations pipe

Static water at

Water level before purl. after purl.

Remarks gravel packed to 170'

15 lbs of bentonite pellets @ 170' (seal)

(over)

70W348 10M REV. 6-2-51

SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
HYDRAULIC DIVISION
WELL DATA

Well Numbers: Owner's 14 | D.W.R. No. 4N/14W-9A2 | Loc. | D.W.R. | F.C. 3850-1

Owner: City of Burbank

Location and Description: 100'S & E of Van Owen St; 55'N. & E of Lima St.

Use: Municipal Supply

Elev. of average grd. at well: _____ U. S. G. S. Datum

Elev. of grd. adjacent to well: 661± U. S. G. S. Datum

Water surface reference points:

(a) From 1-13-52 To _____ Elev. 661.75 How det. Owner
Description: Base of pump

(b) From _____ To _____ Elev. _____ How det. _____
Description: _____

(c) From _____ To _____ Elev. _____ How det. _____
Description: _____

(d) From _____ To _____ Elev. _____ How det. _____
Description: _____

Type of well: _____ Size 20"

Original depth: 732' Soundings: _____

Pumping equipment: _____

Power used: _____

Capacity: 2740 GPM Drawdown 36' Sp. yield 76

Date drilled: Nov. 1949 By _____

Artesian characteristics: _____

Quality of water: _____

Remarks: Data by BAM from owner 12-55
Water Works Div. Of Burbank City, Dwg. # CW-287, 1-10-53

(over)

LOG OF WELL NO. 3850 J

FROM	TO	CLASSIFICATION OF MATERIALS
0	1	top soil
1	9	sand & small rocks
9	11	clay, brown
11	33	clay, sandy - rocks
33	49	sand - rocks
49	69	sand - rocks to 6"
69	82	rocks
82	112	gravel to 3"
112	123	clay, sandy - rocks
123	202	gravel to ¼"
202	215	sand - strips of clay
215	218	sand - gravel - rocks to 6"
218	248	gravel to ¼"
248	278	" " "
278	285	clay, sandy
285	300	clay, yellow, sandy
300	339	" "
339	344	rocks to 6"
344	365	gravel to 2"
365	385	" "
385	408	clay, hard, yellow
408	428	pebble gravel
428	449	clay, sandy, yellow
449	468	clay, hard, yellow
468	477	clay, yellow
477	483	clay, yellow - sand
483	505	clay, yellow
505	520	clay, yellow, hard
520	525	clay, yellow
525	538	gravel to 3"
538	547	gravel to 2"
547	572	clay, yellow, hard
572	590	clay, yellow
590	598	clay, yellow, hard
598	602	clay, yellow, gravel imbedded
602	610	clay, yellow, sandy
610	614	clay, yellow
614	620	sand - gravel
620	642	clay, yellow
642	648	sand - gravel - few rock
648	652	clay, yellow, soft
652	662	sand - gravel
662	668	clay, yellow
668	674	cemented sand - gravel
674	696	clay, brown
696	716	gravel (large), sand
716	732	clay

Cement to 725.35'

Perforations 175-200, 218-280, 341-387, 409-429, 526-549, 616-622, 644-649, 656-664, 669-675, 696-706. 9 holes per 12".

Struck water at

Water level before perf. after perf.

Remarks

(over)

Rev. 7-60 SHEET 1

LOS ANGELES COUNTY
FLOOD CONTROL DISTRICT
Water Conservation Division
WELL DATA

Owner: CITY OF BURBANK

Location and Description: 82' So of Van Owen Street; 80' W. of Lima Street

Use: Municipal Supply

Elev. of average grd. at well: U.S.G.S. Datum

Elev. of grd. adjacent to well: 661± U.S.G.S. Datum

Water surface reference points:

(a) From 6-12-67 To Elev. 661.8 How det. Owners

Description: Base of pump, 0.8' above ave. grd.

(b) From To Elev. How det.

Description:

(c) From To Elev. How det.

Description:

(d) From To Elev. How det.

Description:

Type of well: Size 20"

Original depth: 580' Soundings:

Pumping equipment: Winthroat

Power used:

Capacity: Drawdown:

Date drilled: By

Aquifer characteristics:

Quality of water:

Remarks: Data from field - 8-9-67 - BJM

Well Numbers

Owner: 14A

D.W.R.

F.C. 3850K

DEPARTMENT OF PUBLIC WORKS
GROUNDWATER DATA REPORT

WELL NUMBER: CSBST DWR NUMBER: 1N/14W-14B08
118 18 51.0 34 10 35.0
SAN FERNANDO VALLEY BASIN

	DATE 86/10/08
LABORATORY NUMBER	52545
TIME OF SAMPLE	
TEMPERATURE - FAHN	
SPECIFIC CONDUCTANCE	370
PH	8.3
TDS (PPM)	200
TOTAL HARDNESS (PPM)	110
CALCIUM (PPM)	26.4
MAGESIUM (PPM)	10.6
SODIUM (PPM)	33.5
POTASSIUM (PPM)	3.0
ALKALINITY (PPM)	120
SULFATE (PPM)	41
CHLORIDE (PPM)	21
FLUORIDE (PPM)	0.28
NITRITE-N (PPM)	K0.02
NITRATE-N (PPM)	K0.05
AMONIUM-N (PPM)	K0.001
PHOSPHATE-P (PPM)	K0.05
BORON (PPB)	140
IRON (PPB)	360
MANGANESE (PPB)	K12
TOC (PPM)	NA
ORGANIC-N (PPM)	NA
BOD (PPM)	NA
COD (PPM)	NA

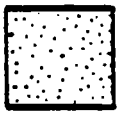
K = LESS THAN NA = NOT ANALYZED

Appendix C
BORING LOGS

Key to Symbols

LITHOLOGY

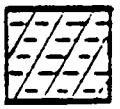

SILT


SAND


CLAY


SILTY SAND


CLAYEY SAND


SILTY CLAY

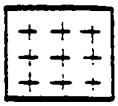

CLAYEY SILT


GRAVELLY SAND


SANDY GRAVEL


SANDY SILT

BORING ANNULUS


CEMENT

Brown and Caldwell

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring [x] Monitoring Well [ ] Boring/Well Number: BC-1 Sheet 1 of 3

Boring Location: Between BC-1 & BC-2		Elevation and Datum: NA	
Drilling Contractor: ABC Liovin	Driller: Doug	Date Started: 10/26/87	Date Finished: 10/26/87
Drilling Equipment: CME-75	Borehole Diameter: 8"	Completed Depth: (feet) 75'	Water Depth: (feet) NA
Sampling Method: California Modified [x] Shelby Tube [ ] Split Spoon [ ]		WELL CONSTRUCTION	
Drilling Fluid: None		Type and Diameter of Well Casing: NA	
Backfill Material: Cement		Slot Size: NA	Filter Material: NA
Logged By: L. Maserjian	Checked By: V. Bedi	Development Method: NA	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology / Annulus / Casing	PID/FID Readings OVA PPM	Remarks
0	SM	Asphaltic-concrete over reddish-brown, silty sand, dry, medium graded, some small pebbles, loose					Relative to 1,1,1, TCA
5			4 5 5	1		44	
10		Becoming gravelly, trace dense material					
	SW	Reddish brown, sand, dry, well graded, fine to coarse grained, some pebbles, trace rocks, dense	12 15 16	2		73	
15		Increasing grain-size very coarse grained	10 12 16	3		115	
20			15 18 20	4		34	
25		Becoming very dense	12 25 28	5		147	
30	SM	Becomes silty sand, dry, fine grained, dense	13 17 28	6		325	

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-1 Sheet 2 of 3

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings OVA PPM	Remarks
		Trace clay, very silty fine-grained							Relative to 1,1,1, TCA
35			13 16 24	7				100	
	SP	Becoming sand, dry, coarse grained, trace silt, dense							
40			13 18 24	8				89	
	SM	Becoming silty sand, dry, medium grained, trace clay, dense							
45		Becoming medium dense	10 11 12	9				105	
50		Becoming very dense	17 25 42	10				157	
		Becoming very coarse-grained, trace gravel some pebbles, dense.							
55		Becoming dark reddish-brown, trace clay and pebbles.	12 16 23	11				71	
60			12 16 23	12				525	
65			12 16 23	13				105	
70		Becoming very coarse grained sand, very dense	16 23 37	14				99	

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-1 Sheet 3 of 3

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings OVA PPM	Remarks
		Increasing cobbles							Relative to 1,1,1, TCA
75		No recovery on 75' sample	50/3						50 blows for 3-inches large cobble or boulder stuck in auger flights cannot turn augers all the way. Pulling out- very slow due to rocks.
80									
85									
90									
95									
100									
105									
110									

Brown and Caldwell

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-2 Sheet 1 of 3

Boring Location: Southwest		Elevation and Datum: NA	
Drilling Contractor: ABC Liovin	Driller: Doug	Date Started: 10/26/87	Date Finished: 10/27/87
Drilling Equipment: CME-75	Borehole Diameter: 8"	Completed Depth: (feet) 85'	Water Depth: (feet) NA
Sampling Method: California Modified ☒ Shelby Tube ☐ Split Spoon ☐		WELL CONSTRUCTION	
Drilling Fluid: None		Type and Diameter of Well Casing: NA	
Backfill Material: Cement		Slot Size: NA	Filter Material: NA
Logged By: L. Maserjian	Checked By: V. Bedi	Development Method: NA	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology / Annulus / Casing	PID/FID Readings OVA PPM	Remarks
	SM	Asphaltic concrete over brown, silty sand, dry, graded, medium, fine, some pebbles, loose					Relative to 1,1,1, TCA
5			2 4 4	1		2	
10	SW	Brown, sand, dry, well graded, coarse grained, some pebbles, dense	10 17 17	2		21	
	SM	Becoming silty sand, dry, well graded, fine-grained, dense					
15	SW	Becoming sandy, dry, coarse grained well graded, trace silt, some pebbles, medium dense.	6 11 16	3		8	
20		Trace rock fragments, dense	10 16 22	4		25	
25		Becoming very coarse-grained graded some rock fragments very dense	15 25 35	5		14	
		Increasing gravel					Drilling through rocks/size?
30	SM	Becoming silty sand, dry, medium grained dense	15 19 27	6		26	

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-2 Sheet 2 of 3

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings OVA PPM	Remarks
									Relative to 1,1,1, TCA
35		Becoming fine-grained, trace clay.	10 15 16	7				101	
40	SW	Becoming sand, dry, well graded, fine to medium, small amount of gravel and dark brown clayey silt lenses, dense	10 13 25	8				80	
45		Becoming med to coarse grained sands.	16 16 32	9				46	
50		Scattered brown 1/4" lenses, silt dry, low plasticity trace clay, very dense.	15 22 32	10				62	
55		Contains layers of both fine to medium and medium to coarse grained sands	21 31 33	11				105	
60	SM	Becoming darker brown clayey, silty sand, dry, low plasticity, dense	10 16 31	12				59	
65	SW	Sand, well graded, med. to coarse dry, with trace clayey silt, fine and gravel, dense	15 17 19	13				90	
		Increasing gravel content							
70		Very dense	12 42/12	14				58	Becomes very stiff, hard to drill.

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-2 Sheet 3 of 3

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings OVA PPM Relative to 1,1,1,TCA	Remarks
									Sampler melted at tip
75	SM/SC	Dark brown clayey, silty sand, dry well graded, fine to coarse, with gravel, very dense, no odor.	13 40/4	15				69	Stopped 10/26 3:30 to check bit. Bit okay-shut down 4 pm. Re-started 10/27 8 am.
		Increasing rock fragments large rocks							
80			28/6 40/2						28 blows for 6 inches 40 blows for 2 inches No recovery
85	GW	Becoming tan sandy gravel, dry, well graded, angular, little or no fines, no odor, some weathering, fragmented gravel, very dense Bottom of Boring 85'	41 40/3	16				55	
90									
95									
100									
105									
110									

Brown and Caldwell

BORING LOG

Project Name: OTI Burbank Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-3 Sheet 1 of 3

Boring Location: S.E. edge of excavation area		Elevation and Datum: NA	
Drilling Contractor: ABC Liovin	Driller: Doug	Date Started: 10/27/87	Date Finished: 10/27/87
Drilling Equipment: CME-75	Borehole Diameter: 8"	Completed Depth: (feet) 75'	Water Depth: (feet) NA
Sampling Method: California Modified ☒ Shelby Tube ☐ Split Spoon ☐		WELL CONSTRUCTION	
Drilling Fluid: None		Type and Diameter of Well Casing: NA	
Backfill Material: Cemented		Slot Size: NA	Filter Material: NA
Logged By: Cheryl Lehr	Checked By: Vijay Bedi	Development Method: NA	

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID OVA PPM Readings	Remarks
	SM	2.5" asphaltic concrete over drk. brown silty sand, moist, fine grained, loose							Relative to 1,1,1, TCA
5			2 2 4	1				.63	
10	SW	Tan to golden gravelly sand, well graded, damp, med. to coarse, dense	14 23 15	2				42	
15		Increasing gravel some large fragments, dry, med. dense	9 12 17	3				42	
20		Scattered small (< 1/8" thick) lenses of greenish gray clayey silt, dry, dense	14 15 17	4				42	
25		Becomes very dense	17 23 38	5				105	
30			18 26 33	6				84	

BORING LOG

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-3 Sheet 2 of 3

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings OVA PPM	Remarks
									Relative to 1,1,1, TCA
35	SM	Becoming brown clayey silty sand, dry, low plasticity, fine grained, very dense	17 40/ 5	7				73	
40	SW	Becoming tan sand, dry, well graded fine to med grained, no fine, dense, slight odor, trace gravel	12 23 25	8				103	
45	SM	Becoming tan silty sand, dry, fine grained, very dense.	10 31 45	9				31	
50	SW	Becoming tan sand, dry, well graded, med. to coarse grained, very dense	18 35 47	10				67	
55			18 41 45	11				38	
60	SM	Brown silty sand, dry, fine grained, slight gravel, medium dense.	7 10 17	12				19	
65		Becoming dense	9 17 21	13				29	
70			10 16 23	14				10	

BORING LOG

1006

Project Name: OTI Project Number: 3526-01

Soil Boring ☒ Monitoring Well ☐ Boring/Well Number: BC-3 Sheet 3 of 3

Depth (feet)	USC Soil Type	Description	Blow Counts	Sample No.	Graphic Log: Lithology	Graphic Log: Annulus	Graphic Log: Casing	PID/FID Readings OVA PPM	Remarks
		Increasing gravel content large fragments 2" dia.							Relative to 1,1,1, TCA
75	SW	Becoming gravelly sands, dry, well graded, 2-4" gravels, very dense.	38 40/4	15				0	OVA reading taken from sand and large rocks, small sample. 0 on 10X scale sample spilled before could read in 1X scale stopped at 75'
80									
85									
90									
95									
100									
105									
110									

Appendix D
ANALYTICAL RESULTS

CHAIN OF CUSTODY RECORD

BC Log Number P87-10-562

Client name	Job number
[illegible]	3526-01

Project name: OT1

Project manager: Steve PraH

Sampler(s): L. Maserjian

Sample number	Date sampled	Time sampled	Type Composite or Grab	Sample description	Number of containers	EPA 8240	418.1					Hazardous sample Special handling required	Remarks
1	10/26	AM		BC-1 5	1	✓	✓						
2	"	"		BC-1 - 10	1	✓	✓						* QCL
3	"	"		BC-1 - 15	1	✓	✓						4 ppb detection
4	"	"		BC-1 - 20	1	✓	✓						limit for 8240
5	"	"		BC-1 - 25	1	✓	✓						50 ppb for 418.1
6	"	"		BC-1 30	1	✓	✓						
7	"	"		BC-1 - 35	1	✓	✓						QA/QC FORMS
8	"	"		BC-1 - 40	1	✓	✓						REQUESTED
9	"	"		BC-1 - 45	1	✓	✓						
10	"	"		BC-1 - 50	1	✓	✓						Head space
11	"	"		BC-1 - 55	1	✓	✓						8240 must
12	"	"		BC-1 - 60	1	✓	✓						include acetone (also to 5-10 ppb DL)

	Signature	Company	Date	Time
Relinquished by	Lisa A. Maserjian	Brown + Caldwell Eng.	10/26/87	5:20
Received by	Ron McRae	B & C	10/26/87	5:20 PM
Relinquished by				
Received by				
Relinquished by				
Received by				

BROWN AND CALDWELL Analytical Laboratories

☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
☐ 373 South Fair Oaks Avenue, Pasadena, CA 91105 (213) 681-4655

Note: Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

0006

CHAIN OF CUSTODY RECORD

BC Log Number 87-10-562

Client name: BC Engineering	Job number: 3526-01
Project name: OT1	
Project manager: [illegible]	Sampler(s): L. Hasegian

Sample number	Date sampled	Time sampled	Type Composite or Grab	Sample description	Number of containers	EPA 8240	418.1	Hazardous sample / Special handling required	Remarks
13	10/26	AM		BC-1-65	1	✓	X		
14	"	"		BC-1-70	1	✓	X		
15	"	PM		BC 2-5	1	✓			4 ppb - BCL
16	"	PM		BC 2 10	1	✓			for 8240
17	"	"		BC 2 15	1	✓			
18	"	"		BC 2 20	1	✓			QA/QC FORMS
19	"	"		BC-2-25	1	✓			REQUESTED
20	"	"		BC 2-30	1	✓			
21	"	"		BC-2-35	1	✓			
22	"	"		BC-2-40	1	✓			
23	"	"		BC-2-50	1	✓			
24	"	"		BC-2-55	1	✓			

	Signature	Company	Date	Time
Relinquished by	Lisa A Hasegian	BC Engineering	10/26/87	5:20
Received by	John McRae	B&C	10/26/87	5:20 PM
Relinquished by				
Received by				
Relinquished by				
Received by				

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Note: Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

1006

CHAIN OF CUSTODY RECORD

BC Log Number 10-1-10-562

Client name	Job number
BC ENS	3256-01

Project name: OTI

Project manager: Stan Pratt

Sampler(s): L. Maserjian

Sample number	Date sampled	Time sampled	Type Composite or Grab	Sample description	Number of containers	EPA 8240	Hazardous sample Special handling required	Remarks
25	10/26	11"		BC-1 60	1	✓		
26	"	"		BC-2 - 65	1	✓		QCL
27	"	"		BC-1 - 70	1	✓		4 ppb detection
28	"	"		BC-2 - 75	1	✓		required for
29	"	"		BC-2 - 45	1	✓		8240
								50 ppb for
								418.1
								QA/QC
								FORMS REQUESTED

Analyses required

	Signature	Company	Date	Time
Relinquished by	Lisa A. Maserjian	BC Engr.	10/26/87	5:20
Received by	Lorraine McRae	B&C	10/26/87	5:20 PM
Relinquished by				
Received by				
Relinquished by				
Received by				

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Note: Samples are discarded 30 days after results are reported unless other arrangements are made.
Hazardous samples will be returned to client or disposed of at client expense.

1006

CHAIN OF CUSTODY RECORD

BC Log Number P87-10-559

Client name	Job number
Brown and Caldwell	3526-01

Project name: OTI Burbank

Project manager: Steve Pratt | Sampler(s): Cheryl Lehr

Sample number	Date sampled	Time sampled	Type Composite or Grab	Sample description	Number of containers	Analyses required: 8240	Hazardous sample / Special handling required	Remarks
16	10/27		Soil	BC-2 85'	1	X		
—	—	—	—	—	1	X		
—	—	—	—	—	1	X		QCL - 5ppb
1	10/27		Soil	BC-3 5'	1	X		for 8240 by head-space expand for acetone
2				BC-3 10'	1	X		QA/QC FORMS
3				BC-3 15'	1	X		REQUESTED after
4				BC-3 20'	1	X		lab specifications.
5				BC-3 25'	1	X		
10				BC 3 30'	1	X		
7				BC-3 35'	1	X		
8				BC-3 40'	1	X		
9				BC-3 45'	1	X		

	Signature	Company	Date	Time
Relinquished by	Cheryl Lehr	Brown and Caldwell	10/27/87	6:30 pm
Received by	Ryan McKay	B & C	10/27/87	6:30 pm
Relinquished by				
Received by				
Relinquished by				
Received by				

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☐ 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300

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Note: Samples are discarded 30 days after results are reported unless other arrangements are made.

Hazardous samples will be returned to client or disposed of at client expense.

1006

CHAIN OF CUSTODY RECORD

BC Log Number 187-10-581

Client name	Job number or Purchase Order number
B.C. Engineers	3526-01

Project name: OTI Burbank

Project manager: Storm Pratt | Sampler(s): Cheryl Lehr

Analyses required: 8240 | Hazardous sample / Special handling required

Sample number	Date sampled	Time sampled	Matrix Type	Sample description	Number of containers	8240	Remarks
10	10/27		Soil	BC-3 50'	1	X	QCL - Spab for
11				BC-3 55'	1	X	8240 by headspace
12				BC-3 60'	1	X	expand for acetone
13				BC-3 65'	1	X	
14				BC-3 70'	1	X	QA/QC Forms
15				BC-3 75'	1	X	requested after lab
							specifications

	Signature	Company	Date	Time
Relinquished by	Cheryl Lehr	Brown and Caldwell	10/27	6:30 pm
Received by		B & C	10/27	6:30 PM
Relinquished by				
Received by				
Relinquished by				
Received by				

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Note: Samples are discarded 30 days after results are reported unless other arrangements are made.

Hazardous samples will be returned to client or disposed of at client expense.

0006

AMENDED REPORT 1006

1-21-88

BROWN AND CALDWELL LABORATORIES

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ANALYTICAL REPORT

LOG NO: P87-10-562

Received: 26 OCT 87
Reported: 25 NOV 87

Steve Pratt
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3526-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-1	BC-1-5	26 OCT 87
10-562-2	BC-1-10	26 OCT 87
10-562-3	BC-1-15	26 OCT 87
10-562-4	BC-1-20	26 OCT 87
10-562-5	BC-1-25	26 OCT 87

PARAMETER	10-562-1	10-562-2	10-562-3	10-562-4	10-562-5
Petroleum Hydrocarbons, IR (EPA Method 418.1), mg/kg	1000	870	1100	<5	113

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ANALYTICAL REPORT

LOG NO: P87-10-562

Received: 26 OCT 87
Reported: 25 NOV 87

Steve Pratt
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3526-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-1	BC-1-5	26 OCT 87
10-562-2	BC-1-10	26 OCT 87
10-562-3	BC-1-15	26 OCT 87
10-562-4	BC-1-20	26 OCT 87
10-562-5	BC-1-25	26 OCT 87

PARAMETER	10-562-1	10-562-2	10-562-3	10-562-4	10-562-5
Vol.Pri.Poll. (EPA-8240)					
Extraction	11/06/87	11/07/87	11/07/87	11/11/87	11/07/87
Dilution Factor, Times 1	1	1	1	1	5
1,1,1-Trichloroethane, ug/kg	120	210	100	<5	200
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5	<5	<5	<25
1,1,2-Trichloroethane, ug/kg	<5	<5	<5	<5	<25
1,1-Dichloroethane, ug/kg	<5	<5	<5	<5	<25
1,1-Dichloroethylene, ug/kg	<5	<5	<5	<5	<25
1,2-Dichloroethane, ug/kg	<5	<5	<5	<5	<25
1,2-Dichloropropane, ug/kg	<5	<5	<5	<5	<25
cis-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<25
2-Chloroethylvinylether, ug/kg	<5	<5	<5	<5	<25
Acrolein, ug/kg	<50	<50	<50	<50	<250
Acrylonitrile, ug/kg	<50	<50	<50	<50	<250
Bromodichloromethane, ug/kg	<5	<5	<5	<5	<25
Bromomethane, ug/kg	<5	<5	<5	<5	<25
Benzene, ug/kg	<5	<5	<5	<5	<25
Chlorobenzene, ug/kg	<5	<5	<5	<5	<25
Carbon Tetrachloride, ug/kg	<5	<5	<5	<5	<25
Chloroethane, ug/kg	<5	<5	<5	<5	<25
Bromoform, ug/kg	<5	<5	<5	<5	<25
Chloroform, ug/kg	<5	<5	<5	<5	<25
Chloromethane, ug/kg	<5	<5	<5	<5	<25

BROWN AND CALDWELL LABORATORIES

373 SOUTH FAIR OAKS AVENUE PASADENA, CA 91105 • (818) 795-7553 • FAX (818) 795-8579

ANALYTICAL REPORT

LOG NO: P87-10-562

Received: 26 OCT 87
Reported: 25 NOV 87

Steve Pratt
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3526-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-1	BC-1-5	26 OCT 87
10-562-2	BC-1-10	26 OCT 87
10-562-3	BC-1-15	26 OCT 87
10-562-4	BC-1-20	26 OCT 87
10-562-5	BC-1-25	26 OCT 87

PARAMETER	10-562-1	10-562-2	10-562-3	10-562-4	10-562-5
Dibromochloromethane, ug/kg	<5	<5	<5	<5	<25
Ethylbenzene, ug/kg	5	<5	<5	<5	<25
Methylene Chloride, ug/kg	<5	<5	<5	13	<25
Tetrachloroethylene, ug/kg	5	70	30	<5	200
Trichloroethylene, ug/kg	<5	<5	<5	<5	<25
Trichlorofluoromethane, ug/kg	<5	<5	<5	<5	<25
Toluene, ug/kg	150	210	87	<5	540
Vinyl Chloride, ug/kg	<5	<5	<5	<5	<25
trans-1,2-Dichloroethylene, ug/kg	<5	<5	<5	<5	<25
trans-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<25
Semi-Quantified Results **					
A C4 Chlorinated Hydrocarbon, ug/kg	---	300	700	---	300
A C6 H14 Hydrocarbon, ug/kg	70	---	---	---	---
Acetone, ug/kg	100	50	80	<50	<250
Dichloropropanoyl Chloride, ug/kg	400	1000	3000	---	3000
Dioxane, ug/kg	---	---	---	200	---
Freon 113, ug/kg	---	---	---	800	---

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

BROWN AND CALDWELL LABORATORIES

373 SOUTH FAIR OAKS AVENUE PASADENA, CA 91105 • (818) 795-7553 • FAX (818) 795-8579

ANALYTICAL REPORT

LOG NO: P87-10-562

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Reported: 25 NOV 87

Steve Pratt
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3526-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-6	BC-1-30	26 OCT 87
10-562-7	BC-1-35	26 OCT 87
10-562-8	BC-1-40	26 OCT 87
10-562-9	BC-1-45	26 OCT 87
10-562-10	BC-1-50	26 OCT 87

PARAMETER	10-562-6	10-562-7	10-562-8	10-562-9	10-562-10
Petroleum Hydrocarbons, IR (EPA Method 418.1), mg/kg	2100	59	13	20	22

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10-562-6	BC-1-30	26 OCT 87
10-562-7	BC-1-35	26 OCT 87
10-562-8	BC-1-40	26 OCT 87
10-562-9	BC-1-45	26 OCT 87
10-562-10	BC-1-50	26 OCT 87

PARAMETER	10-562-6	10-562-7	10-562-8	10-562-9	10-562-10
Vol.Pri.Poll. (EPA-8240)					
Extraction	11/09/87	11/08/87	11/08/87	11/08/87	11/09/87
Dilution Factor, Times 1	10	1	1	1	1
1,1,1-Trichloroethane, ug/kg	59	160	30	11	8
1,1,2,2-Tetrachloroethane, ug/kg	<50	<5	<5	<5	<5
1,1,2-Trichloroethane, ug/kg	<50	52	<5	<5	<5
1,1-Dichloroethane, ug/kg	<50	5	<5	<5	<5
1,1-Dichloroethylene, ug/kg	<50	5	<5	<5	<5
1,2-Dichloroethane, ug/kg	<50	<5	<5	<5	<5
1,2-Dichloropropane, ug/kg	<50	<5	<5	<5	<5
cis-1,3-Dichloropropene, ug/kg	<50	<5	<5	<5	<5
2-Chloroethylvinylether, ug/kg	<50	<5	<5	<5	<5
Acrolein, ug/kg	<500	<50	<50	<50	<50
Acrylonitrile, ug/kg	<500	<50	<50	<50	<50
Bromodichloromethane, ug/kg	<50	<5	<5	<5	<5
Bromomethane, ug/kg	<50	<5	<5	<5	<5
Benzene, ug/kg	<50	<5	<5	<5	<5
Chlorobenzene, ug/kg	<50	<5	<5	<5	<5
Carbon Tetrachloride, ug/kg	<50	<5	<5	<5	<5
Chloroethane, ug/kg	<50	<5	<5	<5	<5
Bromoform, ug/kg	<50	<5	<5	<5	<5
Chloroform, ug/kg	<50	<5	<5	<5	<5
Chloromethane, ug/kg	<50	<5	<5	<5	<5

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-6	BC-1-30	26 OCT 87
10-562-7	BC-1-35	26 OCT 87
10-562-8	BC-1-40	26 OCT 87
10-562-9	BC-1-45	26 OCT 87
10-562-10	BC-1-50	26 OCT 87

PARAMETER	10-562-6	10-562-7	10-562-8	10-562-9	10-562-10
Dibromochloromethane, ug/kg	<50	<5	<5	<5	<5
Ethylbenzene, ug/kg	<50	<5	<5	<5	<5
Methylene Chloride, ug/kg	<50	11	5	<5	<5
Tetrachloroethylene, ug/kg	550	19	<5	<5	<5
Trichloroethylene, ug/kg	<50	<5	<5	<5	<5
Trichlorofluoromethane, ug/kg	<50	<5	<5	5	<5
Toluene, ug/kg	79	9	31	8	5
Vinyl Chloride, ug/kg	<50	<5	<5	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<50	<5	<5	<5	<5
trans-1,3-Dichloropropene, ug/kg	<50	<5	<5	<5	<5
Semi-Quantified Results **					
A C4 Chlorinated Hydrocarbon, ug/kg	3000	---	---	---	---
Acetone, ug/kg	<500	300	80	<50	700
Dichloropropanoyl Chloride, ug/kg	20,000	200	---	---	---
Dioxolane, ug/kg	---	---	---	---	70
Dioxane, ug/kg	500	1000	500	300	600
Freon 113, ug/kg	---	---	---	---	40
Methyl Butynol, ug/kg	---	---	---	100	---

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-11	BC-1-55	26 OCT 87
10-562-12	BC-1-60	26 OCT 87

PARAMETER	10-562-11	10-562-12
Petroleum Hydrocarbons, IR (EPA Method 418.1), mg/kg	<5	<5

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-11	BC-1-55	26 OCT 87
10-562-12	BC-1-60	26 OCT 87

PARAMETER	10-562-11	10-562-12
Vol.Pri.Poll. (EPA-8240)		
Extraction	11/08/87	11/08/87
Dilution Factor, Times 1	1	1
1,1,1-Trichloroethane, ug/kg	5	8
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5
1,1,2-Trichloroethane, ug/kg	<5	6
1,1-Dichloroethane, ug/kg	<5	<5
1,1-Dichloroethylene, ug/kg	<5	<5
1,2-Dichloroethane, ug/kg	<5	6
1,2-Dichloropropane, ug/kg	<5	<5
cis-1,3-Dichloropropene, ug/kg	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5
Acrolein, ug/kg	<50	<50
Acrylonitrile, ug/kg	<50	<50
Bromodichloromethane, ug/kg	<5	<5
Bromomethane, ug/kg	<5	<5
Benzene, ug/kg	<5	<5
Chlorobenzene, ug/kg	<5	<5
Carbon Tetrachloride, ug/kg	<5	<5
Chloroethane, ug/kg	<5	<5
Bromoform, ug/kg	<5	<5
Chloroform, ug/kg	<5	<5
Chloromethane, ug/kg	<5	<5
Dibromochloromethane, ug/kg	<5	<5
Ethylbenzene, ug/kg	<5	<5
Methylene Chloride, ug/kg	<5	<5

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10-562-11	BC-1-55	26 OCT 87
10-562-12	BC-1-60	26 OCT 87

PARAMETER	10-562-11	10-562-12
Tetrachloroethylene, ug/kg	<5	<5
Trichloroethylene, ug/kg	<5	<5
Trichlorofluoromethane, ug/kg	5	<5
Toluene, ug/kg	12	18
Vinyl Chloride, ug/kg	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5
Semi-Quantified Results **		
Acetone, ug/kg	<50	<50
Dioxane, ug/kg	200	100
Methyl Butanol, ug/kg	---	80
Methyl Butynol, ug/kg	---	90

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-15	BC-2-5	26 OCT 87
10-562-16	BC-2-10	26 OCT 87
10-562-17	BC-2-15	26 OCT 87
10-562-18	BC-2-20	26 OCT 87
10-562-19	BC-2-25	26 OCT 87

PARAMETER	10-562-15	10-562-16	10-562-17	10-562-18	10-562-19
Vol.Pri.Poll. (EPA-8240)					
Extraction	11/09/87	11/09/87	11/09/87	11/09/87	11/09/87
Dilution Factor, Times 1	1	1	1	1	1
1,1,1-Trichloroethane, ug/kg	8	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5	<5	<5	<5
1,1,2-Trichloroethane, ug/kg	<5	<5	<5	<5	<5
1,1-Dichloroethane, ug/kg	<5	<5	<5	<5	<5
1,1-Dichloroethylene, ug/kg	<5	<5	<5	<5	<5
1,2-Dichloroethane, ug/kg	<5	<5	<5	<5	<5
1,2-Dichloropropane, ug/kg	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5	<5	<5	<5
Acrolein, ug/kg	<50	<50	<50	<50	<50
Acrylonitrile, ug/kg	<50	<50	<50	<50	<50
Bromodichloromethane, ug/kg	<5	<5	<5	<5	<5
Bromomethane, ug/kg	<5	<5	<5	<5	<5
Benzene, ug/kg	<5	<5	<5	<5	<5
Chlorobenzene, ug/kg	<5	<5	<5	<5	<5
Carbon Tetrachloride, ug/kg	<5	<5	<5	<5	<5
Chloroethane, ug/kg	<5	<5	<5	<5	<5
Bromoform, ug/kg	<5	<5	<5	<5	<5
Chloroform, ug/kg	<5	<5	<5	<5	<5
Chloromethane, ug/kg	<5	<5	<5	<5	<5

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-15	BC-2-5	26 OCT 87
10-562-16	BC-2-10	26 OCT 87
10-562-17	BC-2-15	26 OCT 87
10-562-18	BC-2-20	26 OCT 87
10-562-19	BC-2-25	26 OCT 87

PARAMETER	10-562-15	10-562-16	10-562-17	10-562-18	10-562-19
Dibromochloromethane, ug/kg	<5	<5	<5	<5	<5
Ethylbenzene, ug/kg	<5	<5	<5	<5	<5
Methylene Chloride, ug/kg	<5	<5	<5	<5	<5
Tetrachloroethylene, ug/kg	<5	<5	<5	<5	<5
Trichloroethylene, ug/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane, ug/kg	<5	<5	<5	<5	<5
Toluene, ug/kg	86	18	44	9	22
Vinyl Chloride, ug/kg	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<5
Semi-Quantified Results **					
Acetone, ug/kg	<50	<50	<50	<50	<50
Dioxane, ug/kg	---	---	---	60	100
Freon 113, ug/kg	70	100	---	70	100

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-20	BC-2-30	26 OCT 87
10-562-21	BC-2-35	26 OCT 87
10-562-22	BC-2-40	26 OCT 87
10-562-23	BC-2-50	26 OCT 87
10-562-24	BC-2-55	26 OCT 87

PARAMETER	10-562-20	10-562-21	10-562-22	10-562-23	10-562-24
Vol.Pri.Poll. (EPA-8240)					
Extraction	11/09/87	11/08/87	11/11/87	11/08/87	11/08/87
Dilution Factor, Times 1	1	1	1	1	1
1,1,1-Trichloroethane, ug/kg	13	15	<5	9	52
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5	<5	<5	<5
1,1,2-Trichloroethane, ug/kg	<5	5	<5	<5	<5
1,1-Dichloroethane, ug/kg	<5	<5	<5	<5	<5
1,1-Dichloroethylene, ug/kg	<5	<5	<5	<5	<5
1,2-Dichloroethane, ug/kg	<5	<5	<5	<5	<5
1,2-Dichloropropane, ug/kg	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5	<5	<5	<5
Acrolein, ug/kg	<50	<50	<50	<50	<50
Acrylonitrile, ug/kg	<50	<50	<50	<50	<50
Bromodichloromethane, ug/kg	<5	<5	<5	<5	<5
Bromomethane, ug/kg	<5	<5	<5	<5	<5
Benzene, ug/kg	<5	<5	<5	<5	<5
Chlorobenzene, ug/kg	<5	<5	<5	<5	<5
Carbon Tetrachloride, ug/kg	<5	<5	<5	<5	<5
Chloroethane, ug/kg	<5	<5	<5	<5	<5
Bromoform, ug/kg	<5	<5	<5	<5	<5
Chloroform, ug/kg	<5	<5	<5	<5	<5
Chloromethane, ug/kg	<5	<5	<5	<5	<5

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10-562-20	BC-2-30	26 OCT 87
10-562-21	BC-2-35	26 OCT 87
10-562-22	BC-2-40	26 OCT 87
10-562-23	BC-2-50	26 OCT 87
10-562-24	BC-2-55	26 OCT 87

PARAMETER	10-562-20	10-562-21	10-562-22	10-562-23	10-562-24
Dibromochloromethane, ug/kg	<5	<5	<5	<5	<5
Ethylbenzene, ug/kg	<5	<5	<5	<5	<5
Methylene Chloride, ug/kg	<5	8	25	9	<5
Tetrachloroethylene, ug/kg	<5	<5	<5	<5	<5
Trichloroethylene, ug/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane, ug/kg	<5	6	<5	5	6
Toluene, ug/kg	65	<5	6	18	46
Vinyl Chloride, ug/kg	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<5
Semi-Quantified Results **					
Acetone, ug/kg	<50	<50	70	<50	<50
Dioxane, ug/kg	400	700	300	100	---
Freon 113, ug/kg	---	---	100	---	---

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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10-562-25	BC-2-60	26 OCT 87
10-562-26	BC-2-65	26 OCT 87
10-562-27	BC-2-70	26 OCT 87
10-562-28	BC-2-75	26 OCT 87
10-562-29	BC-2-45	26 OCT 87

PARAMETER	10-562-25	10-562-26	10-562-27	10-562-28	10-562-29
Vol.Pri.Poll. (EPA-8240)					
Extraction	11/08/87/1	11/08/87	11/08/87	11/08/87	11/08/87
Dilution Factor, Times 1	1	1	1	1	1
1,1,1-Trichloroethane, ug/kg	23	21	130	83	33
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5	<5	<5	<5
1,1,2-Trichloroethane, ug/kg	6	<5	10	<5	<5
1,1-Dichloroethane, ug/kg	<5	<5	15	37	<5
1,1-Dichloroethylene, ug/kg	<5	<5	7	11	<5
1,2-Dichloroethane, ug/kg	<5	9	35	<5	<5
1,2-Dichloropropane, ug/kg	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5	<5	<5	<5
Acrolein, ug/kg	<50	<50	<50	<50	<50
Acrylonitrile, ug/kg	<50	<50	<50	<50	<50
Bromodichloromethane, ug/kg	<5	<5	<5	<5	<5
Bromomethane, ug/kg	<5	<5	<5	<5	<5
Benzene, ug/kg	<5	<5	<5	<5	10
Chlorobenzene, ug/kg	<5	<5	<5	<5	<5
Carbon Tetrachloride, ug/kg	<5	<5	<5	<5	<5
Chloroethane, ug/kg	<5	<5	<5	<5	<5
Bromoform, ug/kg	<5	<5	<5	<5	<5
Chloroform, ug/kg	<5	<5	<5	<5	<5
Chloromethane, ug/kg	<5	<5	<5	<5	<5

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10-562-25	BC-2-60	26 OCT 87
10-562-26	BC-2-65	26 OCT 87
10-562-27	BC-2-70	26 OCT 87
10-562-28	BC-2-75	26 OCT 87
10-562-29	BC-2-45	26 OCT 87

PARAMETER	10-562-25	10-562-26	10-562-27	10-562-28	10-562-29
Dibromochloromethane, ug/kg	<5	<5	<5	<5	<5
Ethylbenzene, ug/kg	<5	<5	<5	<5	<5
Methylene Chloride, ug/kg	8	<5	<5	<5	12
Tetrachloroethylene, ug/kg	<5	<5	<5	<5	<5
Trichloroethylene, ug/kg	<5	<5	<5	<5	<5
Trichlorofluoromethane, ug/kg	7	<5	<5	8	<5
Toluene, ug/kg	14	<5	<5	6	<5
Vinyl Chloride, ug/kg	<5	<5	<5	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<5	<5	<5	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5	<5	<5	<5
Semi-Quantified Results **					
Acetone, ug/kg	<50	<50	<50	70	<50
Dioxane, ug/kg	200	---	---	---	100
Methyl Ethyl Ketone, ug/kg	---	---	---	70	---

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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ANALYTICAL REPORT

LOG NO: P87-10-562

Received: 26 OCT 87
Reported: 25 NOV 87

Steve Pratt
Brown and Caldwell
150 S. Arroyo Parkway
Pasadena, California 91109

Project: 3526-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-13	BC-1-65	26 OCT 87
10-562-14	BC-1-70	26 OCT 87

PARAMETER	10-562-13	10-562-14
Vol.Pri.Poll. (EPA-8240)		
Extraction	11/08/87	11/08/87
Dilution Factor, Times 1	1	1
1,1,1-Trichloroethane, ug/kg	27	22
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5
1,1,2-Trichloroethane, ug/kg	8	<5
1,1-Dichloroethane, ug/kg	<5	<5
1,1-Dichloroethylene, ug/kg	<5	<5
1,2-Dichloroethane, ug/kg	15	7
1,2-Dichloropropane, ug/kg	<5	<5
cis-1,3-Dichloropropene, ug/kg	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5
Acrolein, ug/kg	<50	<50
Acrylonitrile, ug/kg	<50	<50
Bromodichloromethane, ug/kg	<5	<5
Bromomethane, ug/kg	<5	<5
Benzene, ug/kg	<5	<5
Chlorobenzene, ug/kg	<5	<5
Carbon Tetrachloride, ug/kg	<5	<5
Chloroethane, ug/kg	<5	<5
Bromoform, ug/kg	<5	<5
Chloroform, ug/kg	<5	<5
Chloromethane, ug/kg	<5	<5
Dibromochloromethane, ug/kg	<5	<5
Ethylbenzene, ug/kg	<5	<5
Methylene Chloride, ug/kg	6	<5

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10-562-13	BC-1-65	26 OCT 87
10-562-14	BC-1-70	26 OCT 87

PARAMETER	10-562-13	10-562-14
Tetrachloroethylene, ug/kg	<5	<5
Trichloroethylene, ug/kg	<5	<5
Trichlorofluoromethane, ug/kg	<5	6
Toluene, ug/kg	<5	30
Vinyl Chloride, ug/kg	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5
Semi-Quantified Results **		
Acetone, ug/kg	<50	<50
Dioxane, ug/kg	50	---
Isopentyl Alcohol, ug/kg	50	---
** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.		
Petroleum Hydrocarbons, IR (EPA Method 418.1), mg/kg	<5	<5

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-30	BC-1-10 BC/QC DUP	26 OCT 87
10-562-31	BC-1-60 BC/QC DUP	26 OCT 87

PARAMETER	10-562-30	10-562-31
Petroleum Hydrocarbons, IR (EPA Method 418.1), mg/kg	750	<5

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-32	BC-1-10 BC/QC SPK	26 OCT 87
10-562-33	BC-1-60 BC/QC SPK	26 OCT 87

PARAMETER	10-562-32	10-562-33
Petroleum Hydrocarbons, IR (EPA Method 418.1), Percent	86	83

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, BLANK WATER SAMPLES	DATE SAMPLED
10-562-34	Reagent Blank	

PARAMETER	10-562-34
Petroleum Hydrocarbons, IR (EPA Method 418.1), mg/kg	<10

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Project: 3526-01

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, BLANK WATER SAMPLES	DATE SAMPLED
10-562-34	Reagent Blank	

PARAMETER	10-562-34
Vol.Pri.Poll. (EPA-8240)	
Extraction	11/08/87
Dilution Factor, Times 1	1
1,1,1-Trichloroethane, ug/kg	<5
1,1,2,2-Tetrachloroethane, ug/kg	<5
1,1,2-Trichloroethane, ug/kg	<5
1,1-Dichloroethane, ug/kg	<5
1,1-Dichloroethylene, ug/kg	<5
1,2-Dichloroethane, ug/kg	<5
1,2-Dichloropropane, ug/kg	<5
cis-1,3-Dichloropropene, ug/kg	<5
2-Chloroethylvinylether, ug/kg	<5
Acrolein, ug/kg	<50
Acrylonitrile, ug/kg	<50
Bromodichloromethane, ug/kg	<5
Bromomethane, ug/kg	<5
Benzene, ug/kg	<5
Chlorobenzene, ug/kg	<5
Carbon Tetrachloride, ug/kg	<5
Chloroethane, ug/kg	<5
Bromoform, ug/kg	<5
Chloroform, ug/kg	<5
Chloromethane, ug/kg	<5
Dibromochloromethane, ug/kg	<5
Ethylbenzene, ug/kg	<5
Methylene Chloride, ug/kg	12
Tetrachloroethylene, ug/kg	<5

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, BLANK WATER SAMPLES	DATE SAMPLED
10-562-34	Reagent Blank	

PARAMETER	10-562-34
Trichloroethylene, ug/kg	<5
Trichlorofluoromethane, ug/kg	16
Toluene, ug/kg	<5
Vinyl Chloride, ug/kg	<5
trans-1,2-Dichloroethylene, ug/kg	<5
trans-1,3-Dichloropropene, ug/kg	<5

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, WATER SAMPLES	DATE SAMPLED
10-562-35	Laboratory Control Standard	

PARAMETER	10-562-35				
Petroleum Hydrocarbons, IR (EPA Method 418.1), Percent	116				

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REPORT OF ANALYTICAL RESULTS

G NO	SAMPLE DESCRIPTION, WATER SAMPLES	DATE SAMPLED
-562-35	Laboratory Control Standard	

RAMETER	10-562-35
l.Pri.Poll. (EPA-8240)	
xtraction	11/08/87
ilution Factor, Times 1	1
,1,1-Trichloroethane, Percent	94
,1,2,2-Tetrachloroethane, Percent	85
,1,2-Trichloroethane, Percent	87
,1-Dichloroethane, Percent	92
,1-Dichloroethylene, Percent	100
,2-Dichloroethane, Percent	86
,2-Dichloropropane, Percent	99
is-1,3-Dichloropropene, Percent	79
-Chloroethylvinylether, Percent	19
crolein, Percent	101
rylonitrile, Percent	125
romodichloromethane, Percent	91
romomethane, Percent	103
nzene, Percent	95
lorobenzene, Percent	104
rbon Tetrachloride, Percent	87
loroethane, Percent	73
romoform, Percent	75
loroform, Percent	100
loromethane, Percent	92
bromochloromethane, Percent	80
thylbenzene, Percent	100
thylene Chloride, Percent	80
etrachloroethylene, Percent	104

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, WATER SAMPLES	DATE SAMPLED
10-562-35	Laboratory Control Standard	

PARAMETER	10-562-35
Trichloroethylene, Percent	104
Trichlorofluoromethane, Percent	74
Toluene, Percent	103
Vinyl Chloride, Percent	91
trans-1,2-Dichloroethylene, Percent	9
trans-1,3-Dichloropropene, Percent	86

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-38	BC-1-20 BC/QC DUP	26 OCT 87
10-562-39	BC-1-70 BC/QC DUP	26 OCT 87

PARAMETER	10-562-38	10-562-39
Vol.Pri.Poll. (EPA-8240)		
Extraction	11/09/87	11/11/87
Dilution Factor, Times 1	1	1
1,1,1-Trichloroethane, ug/kg	<5	<5
1,1,2,2-Tetrachloroethane, ug/kg	<5	<5
1,1,2-Trichloroethane, ug/kg	<5	<5
1,1-Dichloroethane, ug/kg	<5	<5
1,1-Dichloroethylene, ug/kg	<5	<5
1,2-Dichloroethane, ug/kg	<5	<5
1,2-Dichloropropane, ug/kg	<5	<5
cis-1,3-Dichloropropene, ug/kg	<5	<5
2-Chloroethylvinylether, ug/kg	<5	<5
Acrolein, ug/kg	<50	<50
Acrylonitrile, ug/kg	<50	<50
Bromodichloromethane, ug/kg	<5	<5
Bromomethane, ug/kg	<5	<5
Benzene, ug/kg	<5	7
Chlorobenzene, ug/kg	<5	<5
Carbon Tetrachloride, ug/kg	<5	<5
Chloroethane, ug/kg	<5	<5
Bromoform, ug/kg	<5	<5
Chloroform, ug/kg	<5	<5
Chloromethane, ug/kg	<5	<5
Dibromochloromethane, ug/kg	<5	<5
Ethylbenzene, ug/kg	<5	<5
Methylene Chloride, ug/kg	<5	22

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-38	BC-1-20 BC/QC DUP	26 OCT 87
10-562-39	BC-1-70 BC/QC DUP	26 OCT 87

PARAMETER	10-562-38	10-562-39
Tetrachloroethylene, ug/kg	<5	<5
Trichloroethylene, ug/kg	<5	<5
Trichlorofluoromethane, ug/kg	<5	<5
Toluene, ug/kg	16	<5
Vinyl Chloride, ug/kg	<5	<5
trans-1,2-Dichloroethylene, ug/kg	<5	<5
trans-1,3-Dichloropropene, ug/kg	<5	<5
Semi-Quantified Results **		
Acetone, ug/kg	<50	200
Dioxane, ug/kg	100	---
Freon 113, ug/kg	100	300

** Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

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REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, SOIL SAMPLES	DATE SAMPLED
10-562-40	BC-1-20 BC/QC SPK	26 OCT 87
10-562-41	BC-1-70 BC/QC SPK	26 OCT 87

PARAMETER	10-562-40	10-562-41
Vol.Pri.Poll. (EPA-8240)		
Extraction	11/11/87	11/11/87
Dilution Factor, Times 1	1	1
1,1-Dichloroethylene, Percent	95	106
Benzene, Percent	112	107
Chlorobenzene, Percent	126	117
Trichloroethylene, Percent	---	70
Toluene, Percent	118	105
Other Vol.Pri.Poll. (EPA-8240)	---	---

Amended Report, 12/04/87: Corrected sample I.D.
for P87-10-562-29.--DW

[redacted]

Edward Wilson, Laboratory Director

BROWN AND CALDWELL LABORATORIES

373 SOUTH FAIR OAKS AVENUE PASADENA, CA 91105 • (818) 795-7553

January 21, 1988

Mr. Steve Pratt
Brown and Caldwell
150 South Arroyo Parkway
Pasadena, California 91109

Dear Mr. Pratt:

Brown and Caldwell Laboratories is pleased to provide you with its full range of analytical services. Employing a thorough quality assurance/quality control program, the laboratory strives to produce for its clients the most accurate and precise results obtainable given the sample matrix.

In October and December of 1987, you submitted several soil samples to the laboratory for analysis of volatile organic compounds using EPA Method 8240. These samples were analyzed by us under our laboratory log numbers P87-10-562, P87-10-589 and P87-12-096. We understand that you are concerned about some of the volatile organic compounds that were reported to you as a result of these analyses. Specifically, you have expressed concern about the reported presence of Freon 113 and Dioxane in your soil samples.

Dioxane is rarely used in the laboratory. When it is used, it serves only as a reference material for analysis of that specific compound. As a result of Dioxane's infrequent use in the laboratory, it is unlikely that samples could become contaminated with this substance while on the laboratory premises. If samples were contaminated with Dioxane, the contaminant probably would have been introduced prior to our receipt of the samples.

Freon 113 is a solvent that is used regularly in the laboratory. Because of its frequent use, we take every precaution to guard against possible contamination of our client's samples with this substance. However, despite our best efforts, this solvent's use in the laboratory may result, on occasion, in sample contamination.

Since Freon 113 is a highly volatile solvent, its introduction as a contaminant is largely due to transmission of the substance through the air. If such contamination does occur, we expect to find the contaminant at levels less than five times the detection limit of the analysis. Many of the soil samples in question were shown to contain Freon 113 at levels that may indicate possible Freon 113 contamination. However, the high levels of Freon 113 that were reported in other samples could have been caused only by direct exposure to the substance. It is unlikely that direct exposure of the samples to Freon 113 occurred in the laboratory.

After a careful review of the raw data from the 8240 analyses, a Freon 113 calculation error, indicating that less was present than originally reported, was discovered for one of the samples on which client-requested quality control was run. This calculation error coupled with the risk of losing highly volatile compounds during sample preparation, could explain the variable results obtained from duplicate samples.

An amended report correcting the calculation error is being prepared for you.

We appreciate your interest in laboratory procedures and sources of contamination. Our laboratory expects to help you meet the needs of your clients with the fullest possible discussion of results. Please call us if you have any further questions.

Very truly yours,

BROWN AND CALDWELL

Audrey Morris-Seeley

Audrey Morris-Seeley
Senior Chemist

AMS:jb